

**DRAFT
ADDITIONAL SAMPLING OF
SWMUs 2, 4, 13, 17, and 33 REPORT
AK STEEL
KANSAS CITY, MISSOURI**

USEPA ID# MOD007118029

June 2012

Prepared for



AK Steel

By



**Burns & McDonnell Project No. 66252
Burns & McDonnell Engineering Company
Engineers-Architects-Consultants
Kansas City, Missouri**

RCRA



515902

AK Steel Corporation
Environmental Affairs
9227 Centre Pointe Drive
West Chester, Ohio 45069

RECEIVED

JUN 08 2012

AWMD/WRAP-KNRP

June 6, 2012

Jeff Johnson, Chief
Kansas and Nebraska Remediation and Permitting Section
Waste Remediation and Permitting Branch
Air and Waste Management Division
United States Environmental Protection Agency - Region VII
901 North 5th Street
Kansas City, Kansas 66101

Re: HSWA Corrective Action Permit Number MOD 007 118 029
Draft Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report
AK Steel, Kansas City, Missouri

Dear Mr. Johnson:

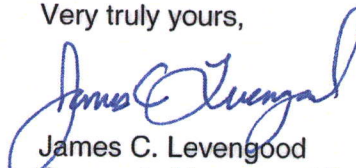
AK Steel is submitting to the Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (MDNR) the *Draft Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report*, which was prepared by Burns & McDonnell Engineering Company, Inc. (BMcD) at our direction. This report was developed to present the results of investigation activities conducted in accordance with the *Final Quality Assurance Sampling and Analysis Plan for the Additional Sampling of SWMUs 2, 4, 13, 17, and 33* (BMcD, 2011).

CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This Report and Certification are submitted on behalf of AK Steel Corporation.

Very truly yours,


James C. Levensgood
Corporate Manager of Environmental Affairs

cc: B. Morrison – EPA Region VII (2 Copies)
C. Kump-Mitchell – MDNR (1 Copy)
B. Stuart – MDNR (2 Copies)
C. Batliner – AK Steel
S. L. Shelton – Burns & McDonnell

RECEIVED

JUN 08 2012

AWMD/WRAP-KNRP

**DRAFT
ADDITIONAL SAMPLING OF
SWMUS 2, 4, 13, 17, and 33 REPORT
AK STEEL
KANSAS CITY, MISSOURI**

EPA ID# MOD007118029

June 2012

Prepared for



AK Steel



**Burns & McDonnell Project No. 66252
Burns & McDonnell Engineering Company
Engineers-Architects-Consultants
Kansas City, Missouri**

TABLE OF CONTENTS

LIST OF APPENDICES	TC-2
LIST OF TABLES	TC-2
LIST OF FIGURES	TC-2
LIST OF ACRONYMS AND ABBREVIATIONS	TC-3
DOCUMENT DISTRIBUTION	TC-5
1.0 Introduction.....	1-1
1.1 Purpose and Scope	1-1
1.2 Background.....	1-2
1.2.1 Facility Location.....	1-2
1.2.2 Facility History	1-2
1.2.3 Permit History.....	1-4
1.2.4 Environmental Setting	1-5
1.3 Report Organization.....	1-5
2.0 Introduction to the Data Presentation	2-1
2.1 Data Analysis	2-2
2.1.1 Quality Control Evaluation	2-2
2.1.2 Screening of Data.....	2-2
2.2 Data Presentation	2-3
3.0 Groundwater Investigation for SWMU 2 and SWMU 4.....	3-1
3.1 SWMU 2 – Old Blue River “W” Landfill.....	3-1
3.1.1 SWMU 2 Background.....	3-1
3.1.2 Summary of Previous Groundwater Investigation Activities	3-1
3.2 SWMU 4 – 1987 Waste Pile.....	3-2
3.2.1 SWMU 4 Background.....	3-2
3.2.2 Summary of Previous Groundwater Investigation Activities	3-2
3.3 Scope of Activities Completed.....	3-3
3.4 SWMUs 2 and 4 groundwater flow direction.....	3-4
3.5 Investigation Results.....	3-4
3.6 Additional Groundwater Sampling Events	3-5
4.0 Surface Material Investigation for SWMUs 13, 17, and 33.....	4-1
4.1 SWMU 13 – Pickle Liquor Tanks.....	4-1
4.1.1 SWMU 13 Background	4-1
4.1.2 Summary of Previous Soil Investigations.....	4-2
4.2 SWMU 17 – Wiremill Rinsewater Neutralization Tank.....	4-2
4.2.1 SWMU 17 Background	4-2
4.2.2 Summary of Previous Soil Investigations.....	4-3
4.3 SWMU 33 – Nail Mill Degreasing Area.....	4-3
4.3.1 SWMU 33 Background	4-3
4.3.2 Summary of Previous Soil Investigations.....	4-3
4.4 Scope of Activities Completed.....	4-4

4.5	Investigation Results.....	4-4
4.5.1	SWMU 13 Results	4-4
4.5.2	SWMU 17 Results	4-4
4.5.3	SWMU 33 Results	4-5
5.0	Summary and Conclusions.....	5-1
5.1	Groundwater at SWMUs 2 and 4	5-1
5.2	Surface Material at SWMUs 13, 17, and 33	5-1
6.0	References.....	6-1

LIST OF APPENDICIES

<u>Appendix</u>	<u>Title</u>
Appendix A	Comprehensive Analytical Result Tables
Appendix B	QA/QC Review of Analytical Data
Appendix C	Monitoring Well Information
Appendix D	Groundwater Sampling Forms
Appendix E	Field Logbook
Appendix F	Photographic Log
Appendix G	Investigation Derived Waste
Appendix H	Survey Data
Appendix I	Analytical Laboratory Reports

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>
Table 2-1	Screening Levels
Table 3-1	SWMU 2 and 4 Sample Collection Summary
Table 3-2	SWMU 2 and 4 Groundwater Elevation Data
Table 3-3	SWMU 2 and 4 Groundwater Sample Detections
Table 4-1	SWMU 13, 17, and 33 Sample Collection Summary
Table 4-2	SWMU 13 Surface Material Results for Metals
Table 4-3	SWMU 17 Surface Material Results for Metals
Table 4-4	SWMU 33 Surface Material Results for Metals

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>
Figure 1-1	Site Location Map
Figure 1-2	Facility Map
Figure 1-3	Ownership Status
Figure 3-1	SWMU 2 and SWMU 4 Monitoring Well Locations
Figure 3-2	Groundwater Elevation Map, 05/15/2012
Figure 4-1	SWMU 13, 17, and 33 Surface Material Sampling Locations

LIST OF ACRONYMS

American AOC	American Properties, LLP area of concern
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
BMWCI	Burns & McDonnell Waste Consultants, Inc.
CCB	Compass Big Blue, LLC
DQI	data quality indicator
Facility	AK Steel, 7000 Winner Road, Kansas City, Missouri
GST	GST Technologies Operating Co., Inc.
Hansen HSPA	Hansen Property Development, Inc. Hazardous and Solid Waste Amendments
I-435	Interstate 435
IDW	investigation derived waste
J	estimated value; result is below the reporting limit or is qualified as estimated
MCL	maximum contaminant level
MDNR	Missouri Department of Natural Resources
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
µg/L	micrograms per liter
NELAP	National Environmental Laboratory Accreditation Program
NFGI	<i>Contract Laboratory Program National Function Guidelines for Inorganic Superfund Data Review</i>
NFGO	<i>Contract Laboratory Program National Function Guidelines for Superfund Organic Data Review</i>
NTU	nephelometric turbidity units
QA	quality assurance
QA SAP	<i>Final Quality Assurance Sampling and Analysis Plan for Additional Sampling of SWMUs 2, 4, 13, 17, and 33</i>
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	reporting limit
RSL	Regional Screening Levels

LIST OF ACRONYMS

SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCLP	toxicity characteristics leaching procedure
TestAmerica-Denver	TestAmerica, Inc.-Denver
TPH	total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

DOCUMENT DISTRIBUTION

USEPA Region 7, Bruce Morrison, Project Manager – 2 copies

Missouri Department of Natural Resources, Christine Kump-Mitchell, Project Manager – 1 copy

Missouri Department of Natural Resources, Bruce Stuart, Sr. Technical Advisor – 2 copies

AK Steel, Cory Levengood – 1 copy

AK Steel, Carl Batliner – 1 copy

Burns & McDonnell Engineering Company, Inc., Sharon Shelton – 2 copies

* * * * *

1.0 INTRODUCTION

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) performed a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and subsequent Supplemental Investigations on behalf of AK Steel (formerly Armco Inc.¹) for their former Kansas City, Missouri Works (Facility). The results of these investigations were summarized in the *RCRA Facility Investigation Report, Armco Kansas City Facility* (RFI Report) (Burns & McDonnell Waste Consultants, Inc. [BMWCI], 1999) and *Supplemental Investigation Report, AK Steel, Kansas City, Missouri* (Burns & McDonnell, 2008). The United States Environmental Protection Agency (USEPA) and Missouri Department of Natural Resources (MDNR) have approved both of these documents in combination to satisfy Special Permit Condition XXX presented in Part II of AK Steel's final Hazardous and Solid Waste Amendments (HSWA) Part B Post-Closure Permit (Permit), which was issued by the USEPA Region 7 on November 30, 1994 (USEPA ID# MOD 007118029). On May 18, 2011, the USEPA requested AK Steel submit a work plan for additional sampling of Solid Waste Management Units (SWMUs) 2, 4, 13, 17, and 33 to address identified data needs to "support a determination that adequate closure was performed or that no further investigation is needed" (USEPA, 2011). In November 2011 the *Final Quality Assurance Sampling and Analysis Plan for Additional Sampling of SWMUs 2, 4, 13, 17, and 33* (QA SAP) was submitted in response to USEPA's letter.

1.1 PURPOSE AND SCOPE

This *Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report* presents the results of soil sampling activities at SWMUs 13, 17, 33 and monitoring well installation/groundwater sampling at SWMUs 2 and 4 at the AK Steel Facility located in Kansas City, Missouri. Figure 1-1 provides a site location map, and Figure 1-2 depicts the Facility layout including locations for each of the SWMUs.

These activities were performed to collect the data requested by USEPA in the May 18, 2011 letter, which include:

- Installation of monitoring wells and collection of groundwater samples to characterize the groundwater downgradient of SWMUs 2 and 4 (between the SWMUs and the Blue River) for total

¹ Effective September 30, 1999, Armco Inc. was merged with and into AK Steel Corporation, a Delaware Corporation with headquarters in West Chester, Ohio.

and filtered lead and cadmium, filtered hexavalent chromium, and volatile organic compounds (VOCs)²; and

- Characterization of RCRA metals in the surface material in areas around SWMUs 13, 17, and 33.

Sample collection methodologies for environmental media, including sampling requirements for quality assurance (QA)/quality control (QC) programs were summarized in the QA SAP (Burns & McDonnell, 2011).

1.2 BACKGROUND

1.2.1 Facility Location

Figure 1-1 presents a Facility Location Map. The Facility is located in northeast Kansas City, Missouri within the Blue River and Missouri River floodplains. Portions of the Facility are located both east and west of Interstate Highway 435 (I-435). Industrial activities were performed exclusively in the area west of I-435, north of 12th Street, and east of Ewing Avenue. Figure 1-2 depicts the Facility, and presents ownership and operational changes that have occurred since issuance of the Permit. The current address for the AK Steel Kansas City Facility is:

AK Steel
7000 Winner Road
Kansas City, Missouri 64125

1.2.2 Facility History

The Kansas City Bolt and Nut Company first occupied the area in 1888. This company manufactured iron bolts and nuts from purchased iron until the early 1920s when open-hearth furnaces were installed. After that time, the company pioneered the production of carbon steel products from 100-percent recycled scrap iron and steel. The company's name was changed in 1925 from the Kansas City Bolt and Nut Company to Sheffield Steel Corporation, and the company became a subsidiary of Armco Steel Corporation in 1930.

² USEPA's May 18, 2011 letter requested analysis of semivolatile organic compounds (SVOCs) for groundwater samples collected from monitoring wells installed at SWMUs 2 and 4. Review of historical sampling data associated with these areas indicates that it was more appropriate to analyze samples for VOCs, as these were the constituents that exhibited exceedances of groundwater screening levels. Analysis for VOCs was specified in the QA SAP (Burns & McDonnell, 2011).

In 1951, Armco completed construction of the No. 1 Melt Shop, which produced steel from 100 percent scrap using electric arc furnace technology. Additional electric arc furnaces were installed in the No. 1 Melt Shop in the mid 1950s and early to late 1960s, for a total of four electric arc furnaces. In 1959, production of steel in open-hearth furnaces was discontinued, and the open-hearth furnaces were later demolished.

Steel ingots produced in both open-hearth and electric arc furnaces were rolled in the 32" Blooming Mill and 18" Rolling Mill to produce billets that were primarily used as feed stock for other plant operations. The 12" Merchant Bar Mill was built and began production in the early 1950s to supplement the 10" Finishing Mill. In 1957, the Rod Mill was built and placed in operation.

A second melt shop complex was built and placed in operation in 1976. The complex included the No. 2 Melt Shop (with two additional electric arc furnaces), a continuous caster, and a 19" Rolling Mill. By 1977, Armco's Kansas City steel production operations included six electric arc furnaces in two melt shops, a blooming mill, and a continuous caster. A multitude of semi-finished and finished products were produced by the 19" Rolling Mill, the 12" Finishing Mill, the Rod Mill, the Wire Mill, the Nail Mill, the Bolt and Nut Plant, and the Grinding Media Facility. A ladle arc refining facility was added to the No. 2 Melt Shop operation in 1989. Economic conditions in the steel industry affected Armco's Kansas City plant, and the diversity of operations was slowly reduced.

By 1993, Armco's Kansas City plant had continued to grow in production tonnage, but production was limited to semi-finished steel products and a minor amount of finished steel products. Historically, the plant operations and property owned by Armco (now AK Steel) totaled approximately 860 acres. Production facilities and a portion of the plant real estate were sold to GST Technologies Operating Company, Inc. (GST), which was doing business as GST Steel Company, on November 12, 1993. Armco retained ownership of approximately 560 acres, of which GST leased approximately 100 acres. GST operated facilities on this property until they filed for bankruptcy in April 2001. There are no active manufacturing operations or activities on the AK Steel property. As part of the bankruptcy proceedings, GST sold the majority of their holdings to Compass Big Blue LLC (CBB).

In the intervening years, the CBB tracts have been sold to House of Burgesses LLC, CTE Properties LLC, Smorgon Steel Grinding Systems LLC³, Blue Summit LLC, and/or Mile Rail LLC. Businesses currently operating on these former CBB parcels include:

- A large metal scrapping operation, Midwest Scrap Management, has been situated on the property owned by House of Burgesses LLC.
- A truck and equipment sales and rental company is present on the CTE Properties LLC parcel.
- A steel grinding ball manufacturing operation is present on the parcel owned by OneSteel, and is doing business as Moly-Cop.
- An environmental and rail service company, specializing in rail car cleaning and maintenance, is located on the Mile Rail, LLC parcel.
- Blue Summit LLC appears to be operating a mill scale excavation and beneficial reuse business on its parcel.

Additionally, approximately 20 acres of GST's property were sold to American Properties LLP (American) during the bankruptcy proceedings, and this property has subsequently been sold to Hansen Property Development, Inc. (Hansen). A U-Pick-It salvage yard currently operates on the Hansen parcel. The ownership and operation of these former GST tracts are now the responsibility of Hansen, House of Burgesses LLC, CTE Properties LLC, OneSteel, Mile Rail LLC, and/or Blue Summit LLC; however, certain SWMUs and areas of concern (AOCs) located on these parcels are listed in AK Steel's Permit for purposes of RCRA Corrective Action. The property ownership and operational changes since the initial permit application and issuance are shown on Figures 1-2 and 1-3.

1.2.3 Permit History

The closed on-site Emission Control Dust Landfill (RCRA Landfill) was operated by Armco from July 1980 through January 25, 1983. During this period the landfill received approximately 29,190 tons (36,000 cubic yards) of hazardous waste identified by waste code K061. The waste, which was generated by melting scrap iron and steel in the plant's six electric arc furnaces, was collected in baghouse air

³ Smorgon Steel Grinding Systems LLC merged with OneSteel Limited in August 2007. Moly-Cop Grinding Media, a division of OneSteel, currently operates this parcel.

pollution control systems and transported to the landfill for disposal. Management of this closed landfill is outlined in AK Steel's Permit. Part I is the final RCRA Hazardous Waste Facility Post-Closure Permit issued by the MDNR with an effective date of February 16, 1994. Part II is the HSWA Corrective Action Permit issued by the USEPA Region VII with an effective date of December 1, 1994.

1.2.4 Environmental Setting

The environmental setting for the Facility was previously described in Section 2 of the RFI Report (BMWCI, 1999).

1.3 REPORT ORGANIZATION

This *Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report* has been prepared by Burns & McDonnell and consists of one volume. This document is organized as follows:

- Section 1.0 – Introduction
- Section 2.0 – Introduction to the Data Presentation
- Section 3.0 – Groundwater Investigation for SWMU 2 and SWMU 4
- Section 4.0 – Surface Material Investigation for SWMUs 13, 17, and 33
- Section 5.0 – Summary and Conclusions
- Section 6.0 – References

* * * * *

2.0 INTRODUCTION TO THE DATA PRESENTATION

During the additional sampling of SWMUs 2, 4, 13, 17, and 33, samples were collected for chemical analyses in accordance with the QA SAP. Section 3.0 presents the findings for the groundwater investigation and Section 4.0 presents the findings for the surface material investigation. A summary of the groundwater and soils samples and analyses is provided in Tables 3-1 and 4-1, respectively. Over the course of the investigation, 24 surface material samples and six monitoring well groundwater samples were collected and submitted for laboratory analysis. Based on previous investigations and site history, chemical analyses for groundwater were conducted for total and filtered lead and cadmium, filtered hexavalent chromium, and VOCs, and chemical analysis for surface materials were conducted for RCRA metals.

General supporting information for the data and text provided in this Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report is provided in the following Appendices:

- Appendix A – Comprehensive Analytical Result Tables
- Appendix B – QA/QC Review of Analytical Data
- Appendix C – Monitoring Well Information
- Appendix D – Groundwater Sampling Forms
- Appendix E – Field Logbook
- Appendix F – Photographic Log
- Appendix G – Investigation Derived Waste
- Appendix H – Survey Data
- Appendix I – Analytical Laboratory Reports

2.1 DATA ANALYSIS

2.1.1 Quality Control Evaluation

TestAmerica, Inc., of Arvada, Colorado (TestAmerica-Denver) provided laboratory services for the additional sampling of SWMUs 2, 4, 14, 17, and 33. TestAmerica-Denver is certified as part of the National Environmental Laboratory Accreditation Program (NELAP).

The laboratory data were reviewed for achievement of QA/QC criteria. Field QC samples included field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), and a temperature blank. Data quality indicators (DQIs) that were evaluated include: precision, accuracy, representativeness, comparability, and completeness. Data verification and validation were performed following procedures outlined in the QA SAP. Data qualifiers, when appropriate, were added to the data in accordance with *USEPA's National Functional Guidelines for Organic Methods Data Review* ([NFGO] USEPA, 2008) and *USEPA's National Functional Guidelines for Inorganic Review* ([NFGI] USEPA, 2010a). A description of data qualifiers assigned by the analytical laboratories and during data verification and validation are provided in Appendix B.

Based upon the results of the data verification and validation, the data were considered valid to use in reporting the results of the Additional Sampling of SWMUs 2, 4, 13, 17, and 33. As indicated in the QA/QC Review of Analytical Data (Appendix B), the objectives for precision, accuracy, representativeness, completeness, and comparability were met.

2.1.2 Screening of Data

Screening levels are used to determine the nature and extent of contamination and may subsequently serve as action levels for various activities. As presented in the QA SAP, the following conventions were used to screen the investigation data.

Groundwater

The groundwater screening levels are presented on Table 2-1, and the discussion in Section 3.0 includes a comparison of sample results to the screening levels. As outlined in the QA SAP (Burns & McDonnell, 2011), if groundwater constituent concentrations are in excess of the applicable screening levels after two years of semi-annual monitoring, monitoring will continue; otherwise, the periodicity of monitoring and constituents to be monitored will be re-evaluated. Constituents that exceed screening levels are highlighted in the data summary table. The following conventions were used for screening the data:

- The analytical data for groundwater was screened against the Safe Drinking Water Act maximum contaminant level (MCL) for constituents that have MCLs.
- If a constituent does not have a MCL, then the USEPA regional screening level (RSL) for tapwater (USEPA, 2012) was used for groundwater data screening.

Surface Soil/Material

The surface material screening levels are presented on Table 2-1, and the discussion in Section 4.0 includes a comparison of sample results to the screening levels. As outlined in the QA SAP (Burns & McDonnell, 2011), if surface material constituent concentrations exceed screening levels, then additional evaluation of the extent will be needed. Constituents that exceed screening levels are highlighted in the data summary table. The following conventions were used for screening the data:

- The surface material analytical data for barium, cadmium, chromium, mercury, selenium, and silver were screened against the industrial soil screening values from the USEPA RSL Summary Table (USEPA, 2012).
- The surface material analytical data for arsenic was screened using background values developed by the U.S. Army Corps of Engineers (USACE) for the USEPA in support of redevelopment projects along the Blue River in Kansas City, Missouri. Since the Blue River bisects the Facility, these values are relevant. The development of these background values is presented in *Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project* (USACE, 2003).
- The surface material analytical data for lead was screened using the site-specific soil preliminary remediation goal for lead (1,531 milligrams per kilogram [mg/kg]) developed by USEPA (USEPA, 2010b).

2.2 DATA PRESENTATION

Analytical data are presented in analytical results data tables, on figures, and in text discussions. Analytical result data tables have been condensed to show only the constituents detected in one or more of the samples for the SWMUs. Comprehensive analytical result tables that provide results for both detected constituents and reporting limits for undetected constituents are provided in Appendix A. Figures are provided to indicate the sampling locations within SWMUs 2, 4, 13, 17, and 33. Sampling locations from the previous RFI are also indicated on the sampling location figures.

* * * * *

3.0 GROUNDWATER INVESTIGATION FOR SWMU 2 AND SWMU 4

3.1 SWMU 2 – OLD BLUE RIVER “W” LANDFILL

3.1.1 SWMU 2 Background

The Old Blue River “W” Landfill (SWMU 2), located on AK Steel property (see Figure 1-2), is a closed landfill previously used to manage emission control dust and solid waste. This W-shaped portion of the Old Blue River channel was used to dispose of emission control dust generated in the No. 1 and No. 2 Melt Shop electric arc furnaces from approximately 1965 until 1980. In addition, general plant and office trash was disposed in this SWMU. SWMU 2 covers an area of approximately 7 acres and is estimated to contain 185,000 cubic yards of material. The landfill was closed through construction of a soil cap (approximately three feet of compacted soil and a vegetative (fescue grass) cover. SWMU 2 is regularly mowed and inspected as a closed landfill. This site has been classified as a Class 4 Site on the Missouri Registry of Confirmed Abandoned or Uncontrolled Sites. Class 4 is defined as “sites that have been previously closed and require continued management” (MDNR, 2011).

3.1.2 Summary of Previous Groundwater Investigation Activities

Over the course of investigations at the Facility, groundwater samples have been collected from 21 direct-push sampling locations at SWMU 2 (See Figure 3-1 for previous sampling locations). Samples were primarily analyzed for filtered cadmium, filtered lead, and VOCs. In addition, the groundwater sample from one location was analyzed for SVOCs (Burns & McDonnell, 2010b). A summary of analytical results follows:

- **Filtered Cadmium and Lead** - Filtered cadmium was not detected in any of the 13 samples for which it was analyzed. Filtered lead was detected in roughly half (13 of the 22) of the groundwater samples for which it was analyzed. Of these detections, eight exceeded the MCL for lead. With the exception of Boring 02B17, groundwater sampling locations that exhibited sample results in excess of the Safe Drinking Water Act MCL were centrally located or to the northeast and in close proximity to the landfill. Exceedances were not observed for samples from locations to the southwest and at greater distance from the landfill cap.
- **VOCs** - VOCs were detected in groundwater samples from eight locations. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were the most frequently detected VOCs. The following five compounds exceeded the groundwater screening level in one or more samples: benzene (Borings 02B04A and 02B21), ethylbenzene (Borings 02B16 and 02B21), xylenes (Boring 02B16), 1,1-dichloroethane (Boring 02B04A), and methylene chloride (Borings 02B15 and 02B19).

- **SVOCs** - One groundwater sample (02B16/DW1) was analyzed for SVOCs. While 2,4-dimethyl phenol (67 micrograms per liter [$\mu\text{g/L}$]) and isophorone (52 $\mu\text{g/L}$) were detected in this sample, neither detection exceeded the applicable USEPA tapwater RSL (USEPA, 2012) (MCLs for 2,4-dimethylphenol and isophorone are not available).

3.2 SWMU 4 – 1987 WASTE PILE

3.2.1 SWMU 4 Background

The 1987 Waste Pile (SWMU 4), located on AK Steel property (see Figure 1-2), consisted of a pile of emission control dust. This waste pile was discovered in 1987 near the Old Blue River “W” Landfill (SWMU 2). The estimated quantity of emission control dust (i.e., K061 dust) in the waste pile was 14,000 cubic yards. It is not known how long the pile was in existence. In 1988, the waste pile was transported off site for reclamation and manifested as emission control dust. The original defined SWMU area was approximately 1.5 acres in size; however, during the RFI, the soil contamination in the SWMU 4 area expanded in size to the west and south to encompass nearly 16 acres.

3.2.2 Summary of Previous Groundwater Investigation Activities

Results of previous soil sampling at SWMU 4 are detailed in the *Soil Screening Report for AK Steel* (Burns & McDonnell, 2009). Over the course of investigations at the Facility, groundwater samples have been collected from 16 direct-push sampling locations at SWMU 4 (See Appendix B of the QA SAP for previous sampling locations). Samples were primarily analyzed for filtered lead; however, three groundwater samples were also analyzed for filtered cadmium, SVOCs, and total petroleum hydrocarbons (TPH). In addition, one sample was also analyzed for pH and VOCs (Burns & McDonnell, 2010b). A summary of analytical results follows:

- **Filtered Cadmium and Lead** - Filtered lead was detected in four of the 16 groundwater samples for which it was analyzed, and the results for three of the centrally-located samples exceeded the MCL. Filtered cadmium was detected in one of the three samples for which it was analyzed, and the detection was below the MCL.
- **SVOCs** - Four SVOCs were detected in one sample (04B02/DW1). While detections were reported for 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, and phenol, none of the detections exceeded their respective tapwater RSLs (MCLs were not available for these SVOCs).
- **VOCs** - No VOCs were detected in the one groundwater sample submitted for VOC analysis.

- **TPH** - USEPA tapwater RSLs and MCLs are not available for the TPH analyses. TPH-extractable was detected in sample 04B02/DW1 at a concentration of 3.32 milligrams per liter (mg/L).

3.3 SCOPE OF ACTIVITIES COMPLETED

For this investigation, roto-sonic drilling techniques were used on February 20-22, 2012, to drill and install six new monitoring wells (2MW01 through 2MW06) in the vicinity of SWMU 2. These monitoring wells were installed to assist with characterizing the groundwater downgradient of SWMUs 2 and 4 (between the SWMUs and the Blue River). Figure 3-1 shows the monitoring well locations.

Monitoring Well 2MW01 was installed to a depth of approximately 45 feet below ground surface (bgs), while the other five monitoring wells were installed to a depth of approximately 30 feet bgs. Monitoring Well 2MW01 was installed to 45 feet bgs because it was placed on the Blue River flood control levee road at an elevation approximately 15 feet above the grade of the other wells. In an effort to have the wells screened at the same depth in the aquifer, the total depth was approximately 15 feet greater than the other wells. All of the monitoring wells were installed in approximately the same water bearing unit of the aquifer. The subsurface material logged during drilling consists mainly of alluvial silt deposits with varying amounts of clays and fine grained sands, with the fine grained sands generally being found at greater depths. This is typical of the Blue River Alluvial Valley sediment profile. Drilling logs and monitoring well construction diagrams are included in Appendix C.

Following monitoring well installation, well development was performed on February 23, 24, 27, and 28, 2012, using a variety of well development techniques including surge and pump, bailing, and airlift. Monitoring Wells 2MW02, 2MW04, and 2MW05 were able to be developed to turbidity under 50 nephelometric turbidity units (NTUs). Monitoring Wells 2MW01, 2MW03, and 2MW06 were developed dry three consecutive times; however, turbidity under 50 NTUs was not achieved. Well development records are included in Appendix C.

The monitoring wells were sampled using low-flow sampling techniques on February 28 and 29, 2012. The sample collection summary is outlined on Table 3-1. Groundwater samples were collected and submitted to TestAmerica-Denver for analysis of VOCs, total cadmium, total lead, dissolved cadmium, dissolved lead, and dissolved hexavalent chromium. Field QC samples included one field duplicate, one MS/MSD pair, one equipment rinse blank, and trip blanks for each cooler containing VOC samples. Groundwater sampling forms are presented in Appendix D.

On February 29, 2012 the four soil investigation derived waste (IDW) drums created during drilling activities were sampled. A discrete soil sample was collected from each drum and submitted to TestAmerica-Denver for analysis of VOCs and toxicity characteristic leaching procedure (TCLP) VOCs. A composite sample from all four drums was also collected and submitted to TestAmerica-Denver for analysis of Total RCRA Metals and TCLP RCRA Metals. Soil IDW results are presented in Appendix G.

On March 1, 2012 the liquid IDW created during drilling activities, well development, and low-flow sampling was transferred from drums at SWMU 2 to the AK Steel main facility and processed through a granular activated carbon unit into an on-site polytank. A sample of the liquid IDW was collected from the poly tank and submitted to TestAmerica-Denver for analysis of VOCs, total cadmium, total lead, dissolved cadmium, dissolved lead, and dissolved hexavalent chromium. Liquid IDW results are presented in Appendix G.

3.4 SWMUS 2 AND 4 GROUNDWATER FLOW DIRECTION

Water levels and total depth measurements were collected on March 1, 2012, after the monitoring wells had been allowed to recover to static conditions following groundwater sampling activities. Upon review of the recorded water levels, it appeared that some wells had not fully recovered to static conditions. Water level measurements were collected again on May 15, 2012 under static conditions. These measurements are presented on Table 3-2, and a groundwater contour map based upon water level measurements on May 15, 2012 is presented as Figure 3-2. Groundwater flow for May 15, 2012 was toward the northeast.

3.5 INVESTIGATION RESULTS

The additional investigation results for SWMU 2 and SWMU 4 are presented on Table 3-3. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table A-1 in Appendix A.

No metals were detected above the respective screening levels. Dissolved cadmium (0.00014 J milligrams per Liter mg/L) and dissolved lead (0.00052 J mg/L) were detected below MCLs (0.005 mg/L, 0.015 mg/L) in Monitoring Wells 2MW01 and 2MW02, respectively. Total cadmium (0.000073 J mg/L – 0.00014 J mg/L) was detected in all samples below the MCL (0.005 mg/L). Total lead (0.001 mg/L - 0.0024 mg/L) was detected in all samples, but did not exceed the MCL (0.015 mg/L). Hexavalent chromium was not detected in any samples.

No VOCs were detected above the respective screening levels. VOCs were not detected in Monitoring Wells 2MW03, 2MW05, and 2MW06. Acetone (2.9 J µg/L) was detected below the RSL (12,000 µg/L),

in Monitoring Well 2MW04. Chloroform was detected below the MCL (80 µg/L) in Monitoring Wells 2MW01 (0.36 J µg/L), 2MW02 (0.35 J µg/L), and 2MW04 (0.24 J µg/L). Ethylbenzene (2.9 µg/L), toluene (1.7 µg/L), and xylenes (17 µg/L) were detected below MCLs (700, 1,000, and 10,000 µg/L) in Monitoring Well MW02. Toluene (0.51 J µg/L) was detected below the MCL (1,000 µg/L) in Monitoring Well 2MW01.

3.6 ADDITIONAL GROUNDWATER SAMPLING EVENTS

Samples will be collected from the six newly installed wells semi-annually for two years, after which time the frequency will be re-evaluated. The next planned sampling event is in August 2012, with February 2013 and August 2013 to follow.

* * * * *

4.0 SURFACE MATERIAL INVESTIGATION FOR SWMUS 13, 17, AND 33

4.1 SWMU 13 – PICKLE LIQUOR TANKS

4.1.1 SWMU 13 Background

The pickle liquor tanks (SWMU 13), located on AK Steel property (see Figure 1-2), were operated from May of 1971 to 1989 and were removed in 1992. As part of the steel rod cleaning operation, sulfuric acid was used to clean iron oxide from steel rods prior to the production of nails, fence, and wire. The term used to describe this process is pickling, and the waste sulfuric acid generated by these pickling activities is referred to as spent pickle liquor.

In 1980, spent pickle liquor became a RCRA-listed hazardous waste with the waste code K062. Prior to 1981, the spent pickle liquor accumulated at this SWMU was sent off site for treatment and disposal. In 1981, Armco installed a recycling system for the spent pickle liquor that remained in use until 1989 when the steel rod cleaning operation ceased and the Cleaning House closed.

Spent pickle liquor was stored in three tanks at different times during the operational life of SWMU 13. These tanks were of varying capacities and dimensions and were located on the east side of the Cleaning House, also known as the Rod Cleaning Building. The spent pickle liquor was transferred from brick-lined acid tubs in the production line by means of overhead piping. Regeneration was accomplished by cooling the spent pickle liquor in a 3,000-gallon, rubber-lined, steel, above ground cooling tank located adjacent to the aboveground storage tank. The cooling caused ferrous sulfate heptahydrate to precipitate from the spent pickle liquor. From the cooling system, regenerated acid was returned to the tubs in the production line. The ferrous sulfate heptahydrate precipitate was sold to chemical supply companies for a number of uses. The most significant use was as a wastewater treatment chemical. The amount of spent pickle liquor generated during cleaning activities varied with the amount of rod cleaned.

The defined SWMU 13 area is less than 0.1 acre in size. In August 1998, modifications were made in the vicinity of SWMU 13 when Armco extended Wilson Avenue in an east-west direction. As part of this modification, various concrete basement walls near SWMU 13 were lowered to below the ground surface. The concrete from the walls and other imported aggregate materials were used to fill any voids in the subsurface. At present, the surface materials consist of slag, other aggregate, and the remnants of building foundations. There is no surface soil, per se, at this location.

4.1.2 Summary of Previous Soil Investigations

Results of previous groundwater sampling at SWMU 13 are detailed in the *Groundwater Screening Report for AK Steel* (Burns & McDonnell, 2010b). Results of the previous soil sampling at SWMU 13 are detailed in the *Soil Screening Report for AK Steel* (Burns & McDonnell, 2009). Over the course of investigations at the Facility, soil samples have been collected from 14 direct-push sampling locations at SWMU 13 (See Figure 4-1 for previous sampling locations). Samples were collected up to 16 feet bgs, and for analysis as follows: VOCs (10 locations), TPH (9 locations), SVOCs (2 locations), metals (1 location), and pH (13 locations).

Related to the investigation activities, samples for analysis of metals were collected from Boring 13B09A at depth intervals of 0 to 2, 2 to 4, 4 to 6, and 6 to 8 feet bgs. The following detections were noted:

- Arsenic – Arsenic was detected in all four soil samples. None of the arsenic results exceeded the 24 mg/kg background value established in the *Blue Valley Industrial Corridor Soils Background Study Report* (USACE, 2003).
- Barium, cadmium, chromium, lead, and mercury were detected in the four samples analyzed for metals. None of the sample results exceeded the USEPA RSL for industrial soil.
- Selenium was not detected in the four samples.
- Silver was detected in one sample. The result was less than USEPA RSL for industrial soil.

4.2 SWMU 17 – WIREMILL Rinsewater Neutralization Tank

4.2.1 SWMU 17 Background

The Wire Mill Rinsewater Neutralization Tank (SWMU 17), located on AK Steel property (see Figure 1-2), consisted of an open-topped 18,000-gallon concrete in ground storage tank with an acid-proof brick lining. During its operation, the tank received acid rinse waters from the hydrochloric acid wire cleaning operations and the sulfuric acid rod cleaning operations. The SWMU 17 tank was cleaned and closed in place in 1991 as part of the closure activities at the Wire Mill. The defined SWMU area is approximately 50 feet by 80 feet. In August 1998, modifications were made in the area when Wilson Avenue was extended in an east-west direction across the west of SWMU 17. As part of this modification, the concrete walls of SWMU 17 were lowered, and the concrete from the walls and other imported aggregate materials were used to fill the void left by the former tank. At present, the surface materials consist of

slag, other aggregate, and the remnants of building foundations. There is no surface soil, per se, at this location.

4.2.2 Summary of Previous Soil Investigations

Results of previous groundwater sampling at SWMU 17 are detailed in the *Groundwater Screening Report for AK Steel* (Burns & McDonnell, 2010b). Results of the previous soil sampling at SWMU 17 are detailed in the *Soil Screening Report for AK Steel* (Burns & McDonnell, 2009). Over the course of investigations at the Facility, soil samples have been collected from three direct-push sampling locations at SWMU 17 (See Figure 4-1 for previous sampling locations) at depths up to 8 feet bgs. These samples were analyzed for VOCs and pH. VOCs were detected in all seven soil samples and included constituents commonly associated with chlorinated solvents. All VOC concentrations were below USEPA RSLs for industrial soil. Sample pH ranged from pH 7.8 to 11.9.

4.3 SWMU 33 – NAIL MILL DEGREASING AREA

4.3.1 SWMU 33 Background

The Nail Mill Degreasing Area (SWMU 33), located on AK Steel property (see Figure 1-2), was used for the removal of residue during the production of nails. The degreasing operation was located in the northwest portion of the Nail Mill. The presence of chlorinated VOCs in the surrounding area was discovered and reported in 1991 while Armco was preparing for the closure and conversion of the mill into a warehouse. The nail mill was subsequently demolished and a wood block floor contaminated with trichloroethene was removed and properly disposed. The Nail Mill Degreasing Area (SWMU 33) currently consists of rubble over the concrete floor of the former building. The defined SWMU 33 area is approximately 2.5 acres in size. At present, the surface materials consist of slag, other aggregate, and the remnants of concrete building foundations. There is no surface soil, per se, at this location.

4.3.2 Summary of Previous Soil Investigations

Results of previous groundwater sampling at SWMU 33 are detailed in the *Groundwater Screening Report for AK Steel* (Burns & McDonnell, 2010b). Results of the previous soil sampling at SWMU 33 are detailed in the *Soil Screening Report for AK Steel* (Burns & McDonnell, 2009) and the *Supplemental Investigation Addendum Report and Pilot Study Work Plan for the SWMU 33, Nail Mill Degreasing Area Soil Investigation* (Burns & McDonnell, 2010a). Over the course of investigations at SWMU 33, soil samples have been collected from 37 sampling locations (See Figure 4-1 for previous sampling locations) at depths up to 20 feet bgs. All of the samples were analyzed for VOCs, and samples from one location were also analyzed for SVOCs. Historical evaluations concluded that a source of chlorinated VOCs

existed in soils under the former degreaser location. Soil concentrations decreased moving radially outward from the former degreaser. In addition, a groundwater plume of chlorinated VOCs and associated degradation products was identified.

4.4 SCOPE OF ACTIVITIES COMPLETED

For the additional sampling, surface material samples were collected with a hand trowel at SWMUs 13, 17, and 33, on March 2, 2012. The intent of this sampling was to close data gaps and to characterize the surface material in areas around SWMUs 13, 17, and 33. Table 4-1 outlines the sample collection and Figure 4-1 presents the sampling locations. Six surface material samples were collected from each SWMU area. The samples were submitted to TestAmerica-Denver for analysis of RCRA Metals. Field QC samples included two field duplicates, one MS/MSD pair, and one equipment rinse blank.

4.5 INVESTIGATION RESULTS

4.5.1 SWMU 13 Results

Additional investigation results for SWMU 13 are presented on Table 4-2. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table A-2 in Appendix A.

No metals were detected above the respective screening levels. Arsenic (4.9 mg/kg – 18 mg/kg), barium (54 B mg/kg – 310 B mg/kg), cadmium (0.81 mg/kg – 6.2 mg/kg), chromium (68 mg/kg – 440 mg/kg), lead (36 mg/kg – 840 mg/kg), mercury (0.02 J mg/kg – 0.54 mg/kg), selenium (0.74 mg/kg – 1.8 mg/kg) and silver (0.14 mg/kg – 0.54 mg/kg) were detected below the respective screening levels in all samples collected from SWMU 13 during the additional sampling.

4.5.2 SWMU 17 Results

Additional investigation results for SWMU 17 are presented on Table 4-3. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table A-3 in Appendix A.

No metals were detected above the respective screening levels. Arsenic (4.0 mg/kg – 20 mg/kg), barium (160 B mg/kg – 290 B mg/kg), cadmium (2.4 mg/kg – 4.6 mg/kg), chromium (250 mg/kg – 1400 mg/kg), lead (69 mg/kg – 240 mg/kg), mercury (0.33 mg/kg – 0.11 mg/kg), selenium (0.66 mg/kg – 0.98 mg/kg) and silver (0.19 mg/kg – 0.62 mg/kg) were detected below the respective screening levels in all samples collected from SWMU 17 during the additional sampling.

4.5.3 SWMU 33 Results

Additional investigation results for SWMU 33 are presented on Table 4-4. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table A-4 in Appendix A.

No metals were detected above the respective screening levels. Arsenic (8.4 mg/kg – 12 mg/kg), barium (170 B mg/kg – 370 B mg/kg), cadmium (1.5 mg/kg – 4.7 mg/kg), chromium (660 mg/kg – 1900 mg/kg), lead (35 mg/kg – 240 mg/kg), mercury (0.014 J mg/kg – 0.13 mg/kg), selenium (0.66 mg/kg – 0.98 mg/kg) and silver (0.65 mg/kg – 1.2 mg/kg) were detected below the respective screening levels in all samples collected from SWMU 33 during the additional sampling.

* * * * *

5.0 SUMMARY AND CONCLUSIONS

On May 18, 2011, the USEPA requested AK Steel submit a work plan for additional sampling of SWMUs 2, 4, 13, 17, and 33 to address identified data needs to “support a determination that adequate closure was performed or that no further investigation is needed” (USEPA, 2011). The purpose of this *Additional Sampling of SWMUs 2, 4, 13, 17, and 33 Report* is to present the results of soil sampling activities at SWMUs 13, 17, 13 and monitoring well installation/groundwater sampling at SWMUs 2 and 4 at the AK Steel Facility located in Kansas City, Missouri.

5.1 GROUNDWATER AT SWMUS 2 AND 4

Six new monitoring wells (2MW01 through 2MW06) were installed to assist with characterizing the groundwater downgradient of SWMUs 2 and 4 (between the SWMUs and the Blue River). Figure 3-1 shows the monitoring wells locations. Following monitor well installation; wells were developed and then sampled using low-flow sampling techniques. The sample collection summary is outlined on Table 3-1. Groundwater samples were collected and submitted to TestAmerica-Denver for analysis of VOCs, total cadmium, total lead, dissolved cadmium, dissolved lead, and dissolved hexavalent chromium. Water levels and total depth measurements were collected and are presented on Table 3-2, and a groundwater contour map is presented as Figure 3-2. Groundwater flow was toward the northeast.

Results for SWMU 2 and SWMU 4 are presented on Table 3-3. Groundwater detections were screened against the Safe Drinking Water Act MCL, and if no MCL was available for the constituent, the USEPA RSL for Tapwater (USEPA, 2012) was used for data screening. No metals or VOCs were detected above their respective screening levels. It is anticipated that once two years of semi-annual monitoring has been completed, the periodicity of monitoring will be decreased.

5.2 SURFACE MATERIAL AT SWMUS 13, 17, AND 33

Surface soil samples were collected with a hand trowel at SWMUs 13, 17, and 33. The intent of this sampling was to close data gaps and to characterize the surface material in areas around SWMUs 13, 17, and 33. Table 4-1 outlines the sample collection and Figure 4-1 presents the sampling locations. Six surface soil samples were collected from each SWMU area. Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver were detected below the respective screening levels in all samples collected from SWMUs 13, 17, and 33 during the Additional Investigation. No further investigation is deemed necessary for SWMUs 13, 17, and 33.

* * * * *

6.0 REFERENCES

- Burns & McDonnell, 2008. *Supplemental Investigation Report for AK Steel, Kansas City, Missouri*. March.
- Burns & McDonnell, 2009. *Soil Screening Report for AK Steel, Kansas City, Missouri*. February.
- Burns & McDonnell, 2010a. *Supplemental Investigation Addendum Report and Pilot Study Work Plan for the SWMU 33 Nail Mill Degreasing Area Soil Investigation for AK Steel, Kansas City, Missouri*. September.
- Burns & McDonnell, 2010b. *Groundwater Screening Report for AK Steel, Kansas City, Missouri*. November.
- Burns & McDonnell, 2011. *Final Quality Assurance Sampling and Analysis Plan for the Additional Sampling of SWMUs 2, 4, 13, 17, and 33 for AK Steel, Kansas City, Missouri*. November.
- Burns & McDonnell Waste Consultants, Inc., 1999. *RCRA Facility Investigation Report, Armco Kansas City Facility*. September.
- Fetter, C.W. 1988. *Applied Hydrogeology*. Second Edition. p. 80-81.
- Missouri Department of Natural Resources (MDNR), 2011. Missouri Registry Annual Report. Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri. Available from: <http://www.dnr.mo.gov/env/hwp/registry-log.pdf>
- United States Army Corps of Engineers (USACE), Kansas City District, 2003. *Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project*. February.
- USEPA, 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June.
- USEPA, 2010a. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic*
- USEPA, 2008c. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Data Review*. January.
- USEPA, 2010b. *Memorandum J. Johnson to B. Morrison, Soil Preliminary Remediation Goals, AK Steel Site, Kansas City, Missouri*. September 13.
- USEPA, 2011. *Additional Sampling Needs at the AK Steel Site, Kansas City, Missouri, EPA ID# MOD 007 118 029*. May 18.
- USEPA, 2012. *Regional Screening Levels (RSLs) Summary Table*. May. Available from: <http://www.epa.gov/region9/superfund/prg>.

* * * * *

TABLES

Table 2-1
Screening Levels

*Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri*

Parameters	Groundwater	
	Screening Level (µg/L)	
Volatile Organic Compounds		
Acetone	12000	RSL
Benzene	5	MCL
Bromodichloromethane	80 a	MCL
Bromoform	80 a	MCL
Bromomethane	7	RSL
2-Butanone (MEK)	4900	RSL
Carbon disulfide	720	RSL
Carbon tetrachloride	5	MCL
Chlorobenzene	100	MCL
Chloroethane	21000	RSL
Chloroform	80 a	MCL
Chloromethane	190	RSL
Dibromochloromethane	80 a	MCL
1,1-Dichloroethane	2.4	RSL
1,2-Dichloroethane	5	MCL
1,1-Dichloroethene	7	MCL
cis-1,2-Dichloroethene	70	MCL
trans-1,2-Dichloroethene	100	MCL
1,2-Dichloropropane	5	MCL
cis-1,3-Dichloropropene	0.41 b	RSL
trans-1,3-Dichloropropene	0.41 b	RSL
Ethylbenzene	700	MCL
2-Hexanone	34	RSL
Methylene Chloride	5	MCL
4-Methyl-2-pentanone (MIBK)	1000	RSL
Styrene	100	MCL
1,1,2,2-Tetrachloroethane	0.066	RSL
Tetrachloroethene	5	MCL
Toluene	1000	MCL
1,1,1-Trichloroethane	200	MCL
1,1,2-Trichloroethane	5	MCL
Trichloroethene	5	MCL
Vinyl chloride	2	MCL
Xylenes, Total	10000	MCL
Metals		
Cadmium	5	MCL
Chromium, Hexavalent	0.043	RSL
Lead	15	MCL

Notes:

a = Value is for total trihalomethanes: bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

b = Value is for 1,3-Dichloropropene, isomer not specified.

RSL = Regional Screening Level from *Regional Screening Levels (RSLs) Summary Table*, USEPA, May 2012.

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

**Table 2-1
Screening Levels**

*Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri*

Parameters	Soil	
	Industrial Soil RSL (mg/kg)	
Metals		
Arsenic	24	BVBG
Barium	190000	RSL
Cadmium	800	RSL
Chromium	1500000	RSL
Lead	1531	PRG
Mercury	43	RSL
Selenium	5100	RSL
Silver	5100	RSL

Notes:

BVBG = Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG = Site-specific PRG for lead (USEPA, 2010)

RSL = Regional Screening Level from *Regional Screening Levels (RSLs) Summary Table*, USEPA, May 2012.

MCL = Maximum Contaminant Level

mg/kg = milligrams per kilogram

Table 3-1
SWMUs 2 and 4 Sample Collection Summary
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Sample Point	Sample and QA/QC Designators	Date Collected	QA/QC Sample Type	Analysis					
				VOCs	Total Lead	Filtered Lead	Total Cadmium	Filtered Cadmium	Filtered Hexavalent Chromium
SWMU 2 - Old Blue River "W" Landfill and SWMU 4 - 1987 Waste Pile									
2MW01	GW01	2/28/2012	Matrix Spike Matrix Spike Duplicate	X	X	X	X	X	X
2MW02	GW01	2/28/2012		X	X	X	X	X	X
2MW02	GW01MS	2/28/2012		X	X	X	X	X	X
2MW02	GW01MSD	2/28/2012		X	X	X	X	X	X
2MW03	GW01	2/29/2012	Duplicate	X	X	X	X	X	X
2MW04	GW01	2/29/2012		X	X	X	X	X	X
2MW04	GW01A	2/29/2012		X	X	X	X	X	X
2MW05	GW01	2/29/2012		X	X	X	X	X	X
2MW06	GW01	2/29/2012		X	X	X	X	X	X

Notes:

ft bgs - Feet below ground surface
QA/QC - Quality Assurance/Quality Control
VOCs - Volatile Organic Compounds

Table 3-2
SWMUs 2 and 4 Groundwater Elevation Data
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Well	Date Measured	Easting	Northing	Elevation (feet above MSL)			Total Depth Constructed (feet below TOC)	Field Measurement (feet below TOC)		Percent Occluded	Water Level Elevation (feet above MSL)
				Ground Surface	Top of Casing	Bottom of Casing		Water Level	Total Depth		
SWMU 2 - Old Blue River "W" Landfill and SWMU 4 - 1987 Waste Pile											
2MW01	3/1/2012	507347.8	1074759	745.96	748.5	45.19	47.73	32.60	47.73	0	715.90
	5/15/2012	507347.8	1074759	745.96	748.5	45.19	47.73	32.37	NM	0	716.13
2MW02	3/1/2012	509101.6	1075471.6	731.87	734.19	30.43	32.75	22.75	32.75	0	711.44
	5/15/2012	509101.6	1075471.6	731.87	734.19	30.43	32.75	20.78	NM	0	713.41
2MW03	3/1/2012	508392.5	1074851.6	729.88	732.21	30.39	32.72	14.58	32.72	0	717.63
	5/15/2012	508392.5	1074851.6	729.88	732.21	30.39	32.72	18.13	NM	0	714.08
2MW04	3/1/2012	508611.3	1074549.8	730.63	733.16	30.20	32.73	21.34	32.73	0	711.82
	5/15/2012	508611.3	1074549.8	730.63	733.16	30.20	32.73	19.43	NM	0	713.73
2MW05	3/1/2012	507648.7	1074232.1	729.05	731.40	30.35	32.70	13.61	32.70	0	717.79
	5/15/2012	507648.7	1074232.1	729.05	731.40	30.35	32.70	13.83	NM	0	717.57
2MW06	3/1/2012	507636.1	1073891.5	730.67	733.16	30.48	32.97	15.36	32.97	0	717.80
	5/15/2012	507636.1	1073891.5	730.67	733.16	30.48	32.97	14.50	NM	0	718.66

Notes:

MSL = Mean Sea Level
 NM = Not Measured
 TOC = Top of Casing

Table 3-3
SWMUs 2 and 4 Groundwater Sample Detections
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Groundwater Screening Level		Sample ID:	2MW01-GW01	2MW02-GW01	2MW03-GW01	2MW04-GW01	2MW04-GW01A	2MW05-GW01	2MW06-GW01
			Date:	2/28/2012	2/28/2012	2/29/2012	2/29/2012	2/29/2012	2/29/2012	2/29/2012
			Lab ID:	280-26041-3	280-26041-2	280-26092-5	280-26092-2	280-26092-3	280-26092-4	280-26092-6
			Comments:					Field Duplicate		
METALS										
Cadmium, Dissolved	0.005	MCL	mg/L	0.00014 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium, Total	0.005	MCL	mg/L	0.00014 J	0.00011 J	0.000093 J	0.000073 J	0.000077 J	0.000097 J	0.000096 J
Lead, Dissolved	0.015	MCL	mg/L	0.001 U	0.00052 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead, Total	0.015	MCL	mg/L	0.0023	0.0015	0.0015	0.001	0.001	0.0024	0.0011
VOLATILE ORGANIC COMPOUNDS										
Acetone	12,000	RSL	µg/L	30 U*	18 U*	10 U	2.9 J	3 J	10 U	10 U
Chloroform	80 a	MCL	µg/L	0.36 J	0.35 J	1 U	0.24 J	0.25 J	1 U	1 U
Ethylbenzene	700	MCL	µg/L	1 U	2.9	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	MCL	µg/L	0.51 J	1.7	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	10,000	MCL	µg/L	2 U	17	2 U	2 U	2 U	2 U	2 U

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

a - Value is for total trihalomethanes: bromoform, bromodichloromethane, chloroform, and dibromochloromethane.

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

mg/L - milligrams per liter

µg/L - micrograms per liter

MCL - Safe Drinking Water Act Maximum Contaminant Level (USEPA, 2009)

RSL - Regional Screening Level Summary Table (USEPA, May 2012)

U* - Qualified as not detected during QC review.

Table 4-1
SWMUs 13, 17, and 33 Sample Collection Summary
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Sample Point	Sample Designator & Point	Date Collected	Sample Type	Depth of Sample (ft bgs)	RCRA Metals (SW846 6010 / 7471)
SWMU 13 - Pickle Liquor Tanks					
13SM01	SS01-0.5	3/2/2012	Duplicate	0.0 - 0.5	X
13SM01	SS01-0.5A	3/2/2012		0.0 - 0.5	X
13SM02	SS01-0.5	3/2/2012		0.0 - 0.5	X
13SM03	SS01-0.5	3/2/2012		0.0 - 0.5	X
13SM04	SS01-0.5	3/2/2012		0.0 - 0.5	X
13SM05	SS01-0.5	3/2/2012		0.0 - 0.5	X
13SM06	SS01-0.5	3/2/2012		0.0 - 0.5	X
SWMU 17 - Wiremill Rinsewater Neutralization Tank					
17SM01	SS01-0.5	3/2/2012	Duplicate	0.0 - 0.5	X
17SM02	SS01-0.5	3/2/2012		0.0 - 0.5	X
17SM03	SS01-0.5	3/2/2012		0.0 - 0.5	X
17SM04	SS01-0.5	3/2/2012		0.0 - 0.5	X
17SM05	SS01-0.5	3/2/2012		0.0 - 0.5	X
17SM05	SS01-0.5A	3/2/2012		0.0 - 0.5	X
17SM06	SS01-0.5	3/2/2012		0.0 - 0.5	X
SWMU 33 - Nail Mill Degreasing Area					
33SM01	SS0-0.5	3/2/2012	MS MSD	0.0 - 0.5	X
33SM02	SS0-0.5	3/2/2012		0.0 - 0.5	X
33SM03	SS0-0.5	3/2/2012		0.0 - 0.5	X
33SM03	SS0-0.5MS	3/2/2012		0.0 - 0.5	X
33SM03	SS0-0.5MSD	3/2/2012		0.0 - 0.5	X
33WM04	SS0-0.5	3/2/2012		0.0 - 0.5	X
33WM05	SS0-0.5	3/2/2012		0.0 - 0.5	X
33SM06	SS0-0.5	3/2/2012		0.0 - 0.5	X

Notes:

ft bgs - Feet below ground surface

MS - Matrix Spike

MSD - Matrix Spike Duplicate

RCRA - Resource Conservation and Recovery Act

Table 4-2
SWMU 13 Surface Material Results for Metals
Pickle Liquor Tanks

Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID:	13SM01-SS01	13SM01-SS01A	13SM02-SS01	13SM03-SS01	13SM04-SS01	13SM05-SS01	13SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-3	280-26217-4	280-26217-5	280-26217-6	280-26217-7	280-26217-8	280-26217-9
			Comments:		Field Duplicate					
METALS										
Arsenic, Total	24	BVBG	mg/kg	11	14	5	10	6.3	4.9	18
Barium, Total	190000	RSL	mg/kg	260 B	310 B	80 B	150 B	98 B	54 B	170 B
Cadmium, Total	800	RSL	mg/kg	6.2	5	1.1	3.4	2	0.81	6.8
Chromium, Total	1500000	RSL	mg/kg	340	440	68	170	96	89	93
Lead, Total	1531	PRG	mg/kg	390	460	65	100	53	36	840
Mercury, Total	310	RSL	mg/kg	0.68	0.64	0.31	0.086	0.037	0.02 J	0.079
Selenium, Total	5100	RSL	mg/kg	1.1	1	0.91	1.8	1.1	1	0.74
Silver, Total	5100	RSL	mg/kg	0.39	0.54	0.14	0.34	0.18	0.19	0.53

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

ft bgs - feet below ground surface

mg/kg - milligrams per kilogram

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, May 2012)

Table 4-3
SWMU 17 Surface Material Results for Metals
Wiremill Rinsewater Neutralization Tank

Additional Sampling of SWMUs 2, 4, 13, 17, and 33

AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID:	17SM01-SS01	17SM02-SS01	17SM03-SS01	17SM04-SS01	17SM05-SS01	17SM05-SS01A	17SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-10	280-26217-11	280-26217-12	280-26217-13	280-26217-14	280-26217-15	280-26217-16
			Comments:						Field Duplicate	
METALS										
Arsenic, Total	24	BVBG	mg/kg	4.7	19	20	4	7	6.7	8.9
Barium, Total	190000	RSL	mg/kg	160 B	220 B	240 B	160 B	290 B	200 B	290 B
Cadmium, Total	800	RSL	mg/kg	3.6	4.6	2.9	2.4	2.4	3	3.8
Chromium, Total	1500000	RSL	mg/kg	250	740	1200	450	940	850	1400
Lead, Total	1531	PRG	mg/kg	130	240	160	69	100	120	230
Mercury, Total	310	RSL	mg/kg	0.11	0.039	0.1	0.035	0.033	0.04	0.068
Selenium, Total	5100	RSL	mg/kg	0.98	0.98	0.79	0.66	0.83	0.78	0.9
Silver, Total	5100	RSL	mg/kg	0.24	0.31	0.42	0.19	0.27	0.26	0.62

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

ft bgs - feet below ground surface

mg/kg - milligrams per kilogram

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, May 2012)

Table 4-4
SWMU 33 Surface Material Results for Metals
Nail Mill Degreasing Area

Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID:	33SM01-SS01	33SM02-SS01	33SM03-SS01	33SM04-SS01	33SM05-SS01	33SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-22	280-26217-21	280-26217-20	280-26217-19	280-26217-18	280-26217-17
			Comments:						
METALS									
Arsenic, Total	24	BVBG	mg/kg	12	8.4	9.3	9.2	9.5	8.9
Barium, Total	190000	RSL	mg/kg	350 B	170 B	340 B	330 B	190 B	370 B
Cadmium, Total	800	RSL	mg/kg	2.4	1.5	4.1	4.7	1.9	4.4
Chromium, Total	1500000	RSL	mg/kg	920	1400	1300	950	660	1900
Lead, Total	1531	PRG	mg/kg	120	35	230	240	59	220
Mercury, Total	310	RSL	mg/kg	0.06	0.014 J	0.13	0.074	0.027	0.11
Selenium, Total	5100	RSL	mg/kg	0.65	0.67	1.2	0.76	0.67	1.1
Silver, Total	5100	RSL	mg/kg	0.33 J	0.18 J	0.65	0.46	0.24	0.57

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

ft bgs - feet below ground surface

mg/kg - milligrams per kilogram

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, May 2012)

FIGURES



LEGEND:



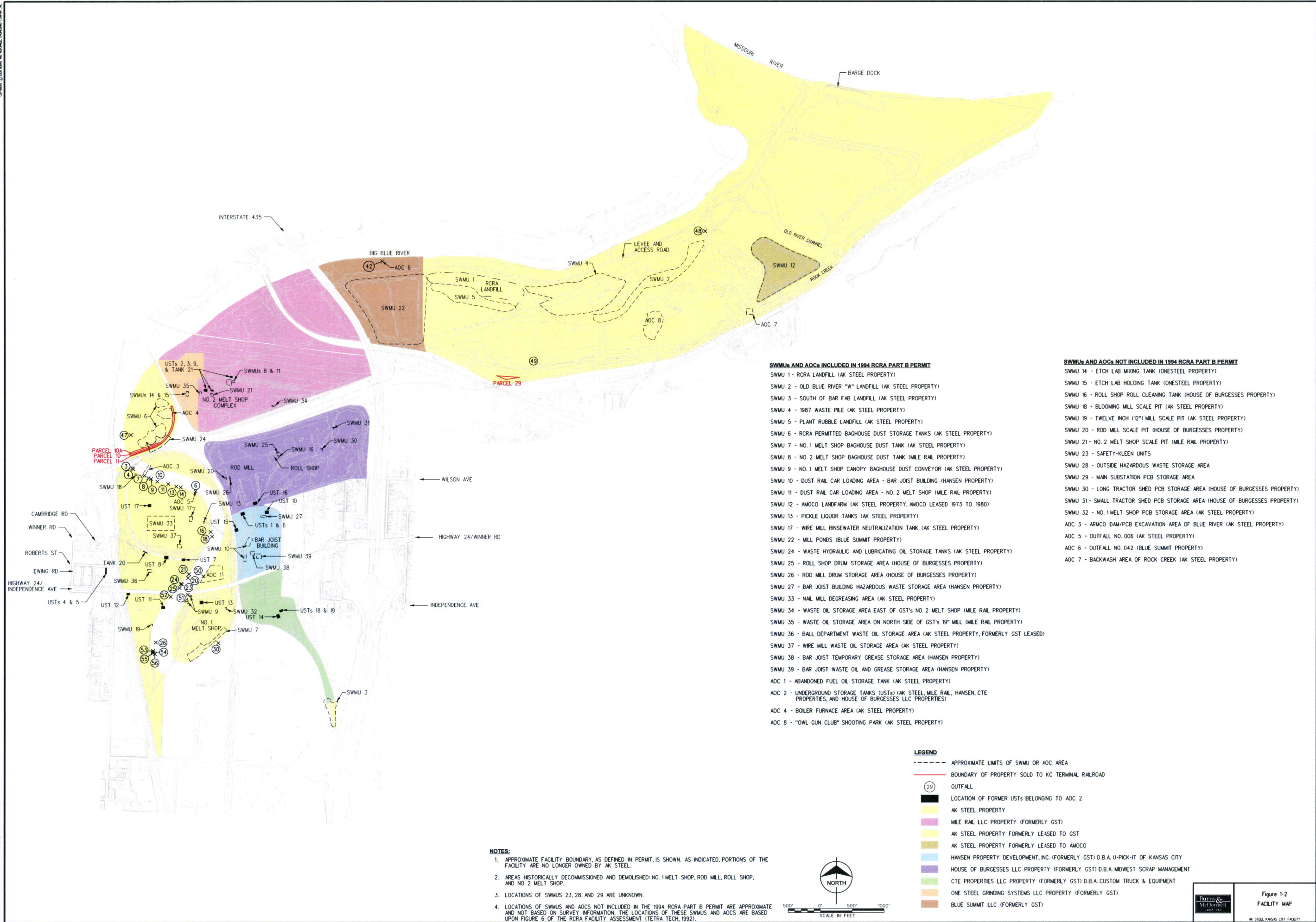
AK STEEL PROPERTY BOUNDARY

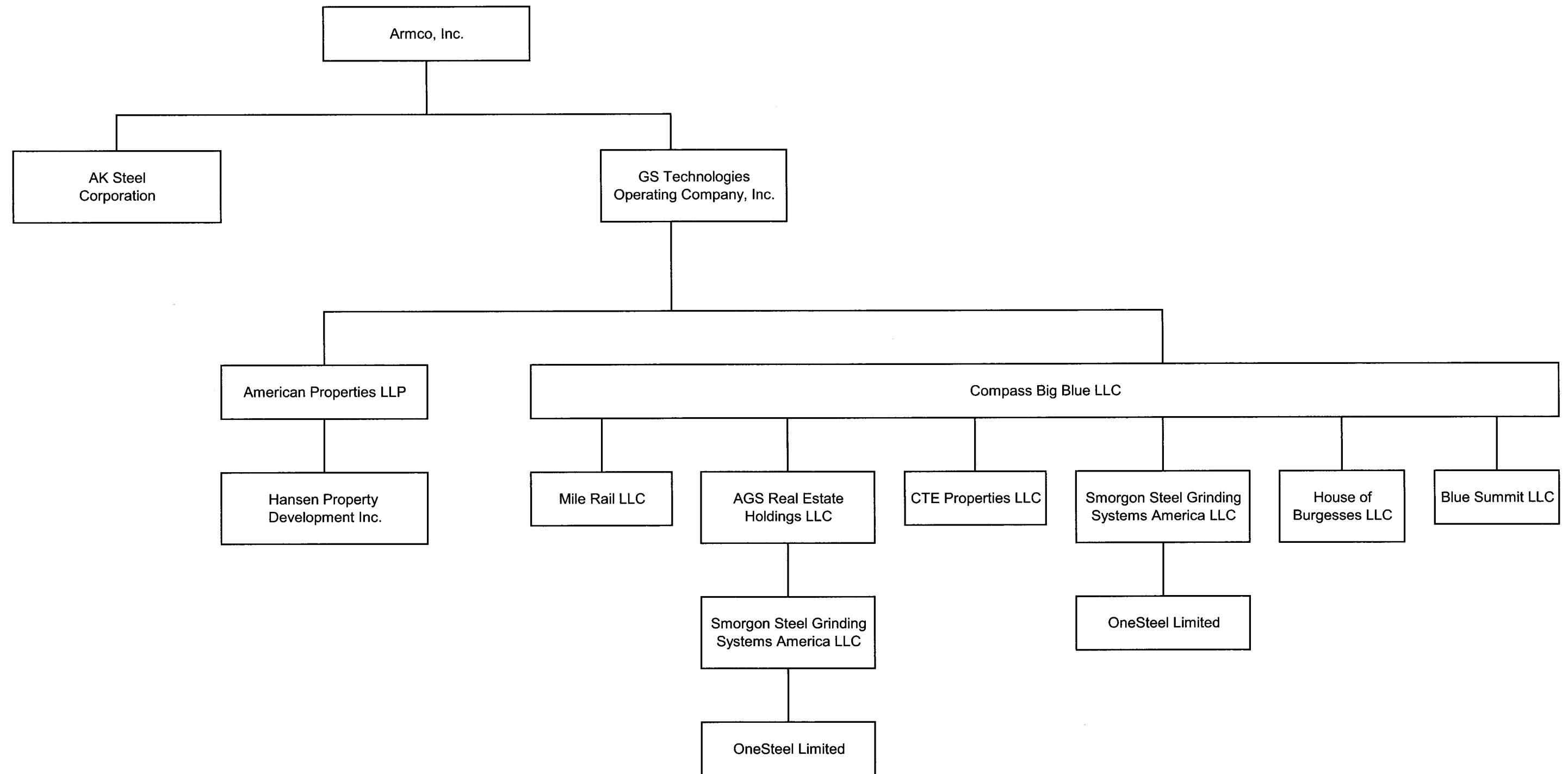


0 2000' 4000'
SCALE IN FEET



Figure 1-1
FACILITY LOCATION MAP
AK STEEL
KANSAS CITY, MISSOURI





Note: Ownership based on search of Jackson County, Missouri online public records (<http://records.co.jackson.mo.us/localization/menu.asp>).
 Most recent Warranty Deed was dated December 9, 2010 (CBB to Mile Rail LLC). All CBB tracts have been sold.
 American Grinding Systems (AGS) was sold to Smorgon Steel in October 2004, and Smorgon Steel merged with OneSteel Limited in August 2007.



Figure 1-3
Ownership Status
 AK Steel Kansas City Facility

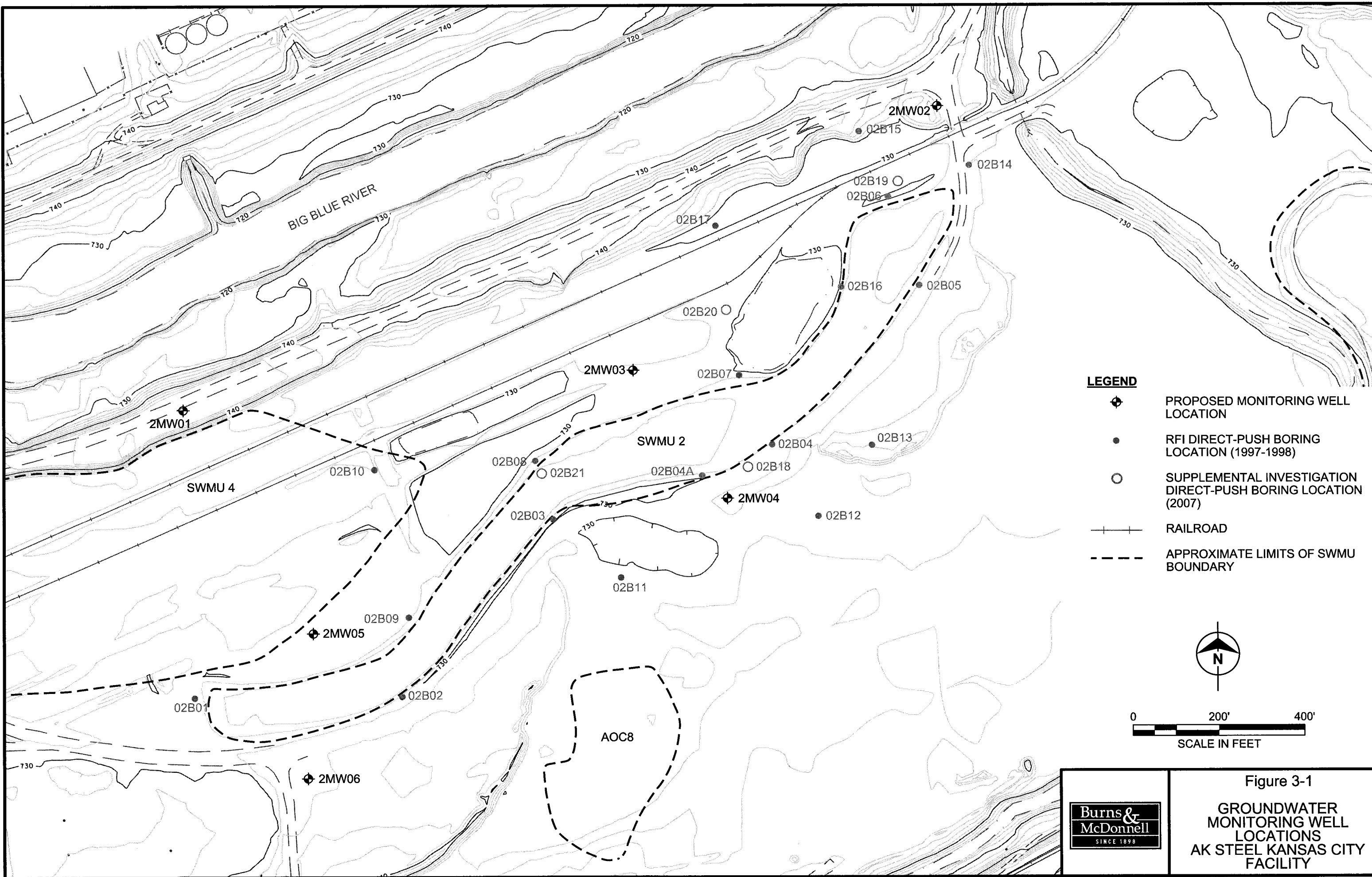
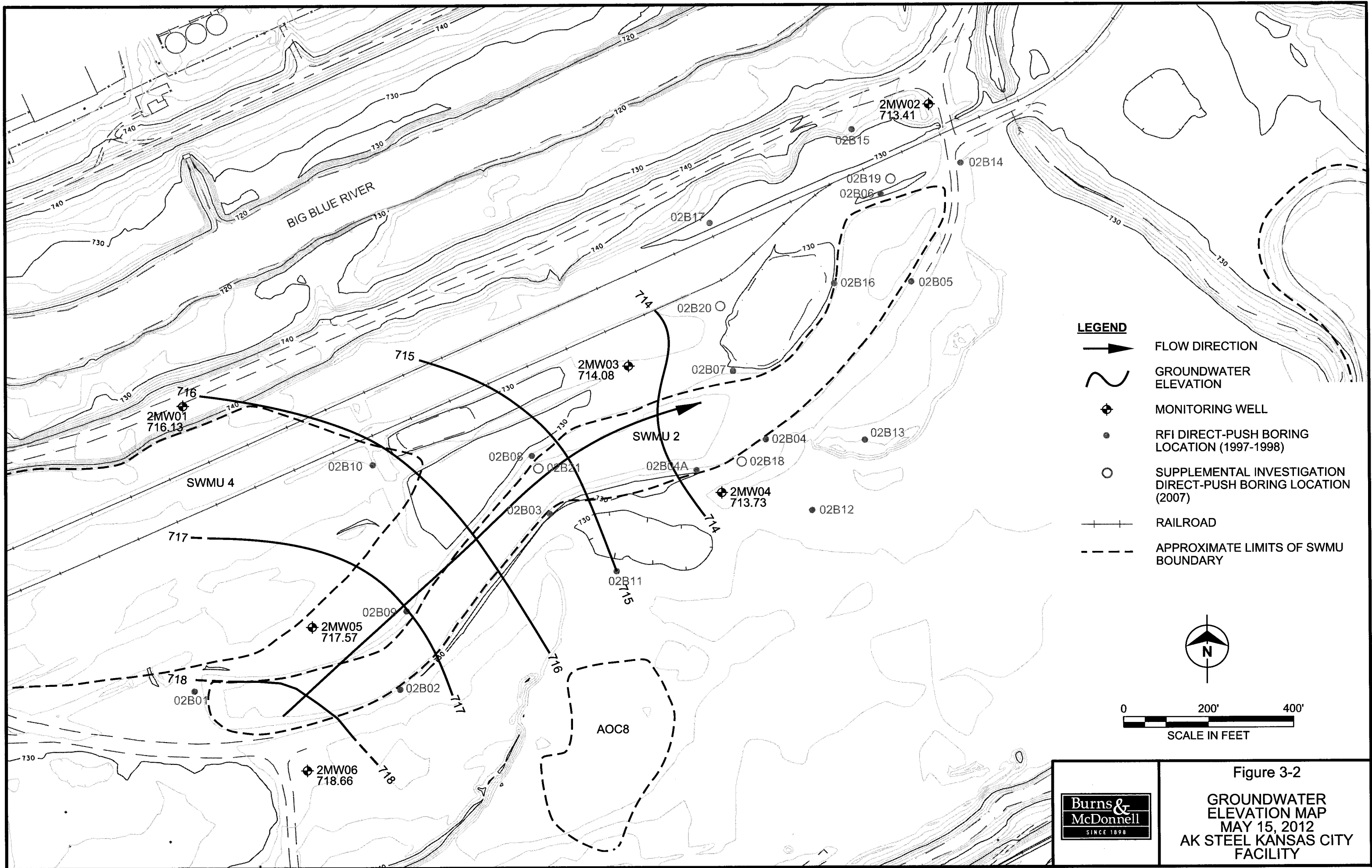
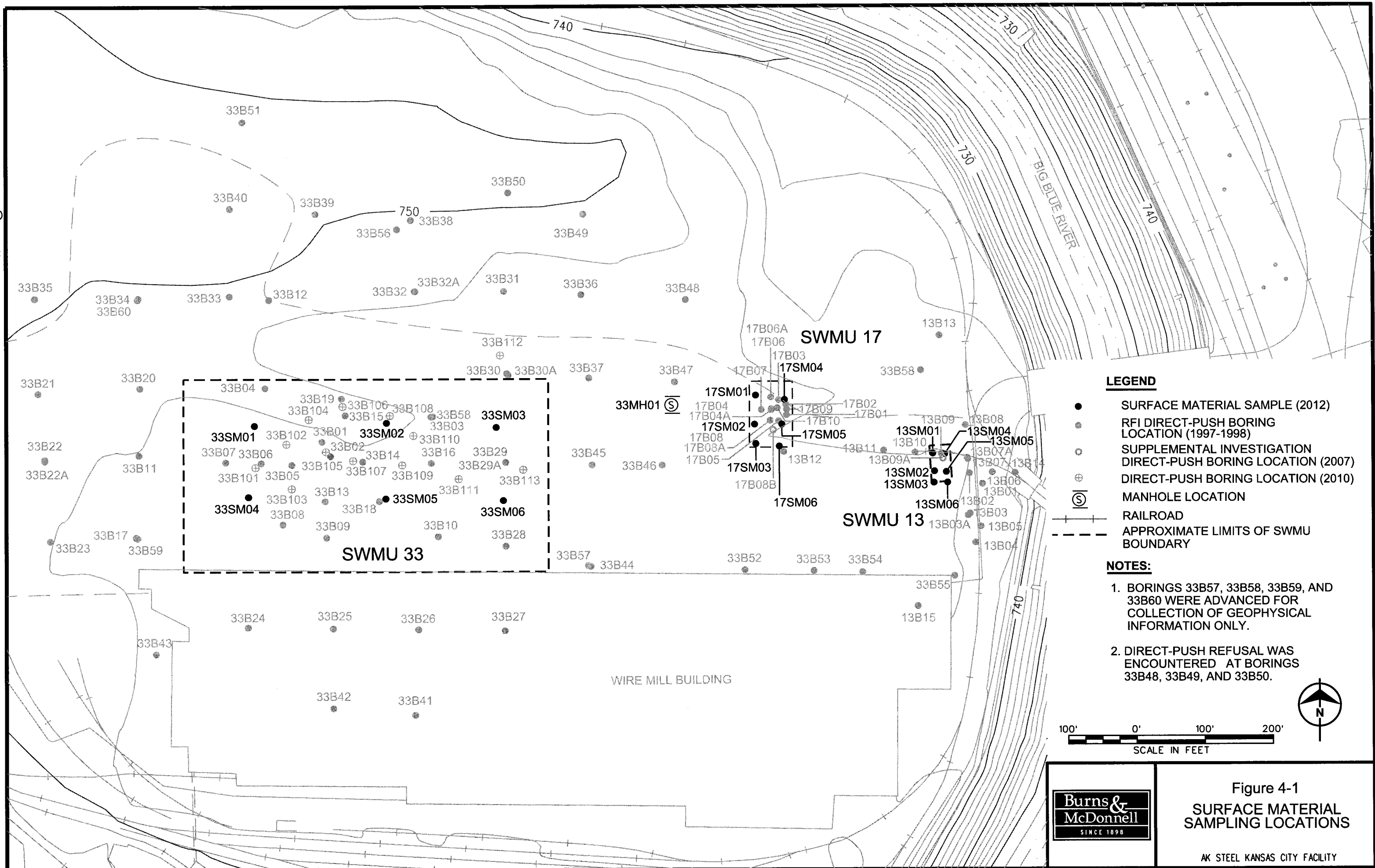


Figure 3-1
GROUNDWATER
MONITORING WELL
LOCATIONS
AK STEEL KANSAS CITY
FACILITY





APPENDICES

APPENDIX A

Comprehensive Analytical Results Tables

A-1 – SWMUs 2 and 4 Groundwater Sample Results

A-2 – SWMU 13 Surface Material Results

A-3 – SWMU 17 Surface Material Results

A-4 – SWMU 33 Surface Material Results

Table A-1
SWMUs 2 and 4 Groundwater Sample Results

*Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri*

Parameter	Groundwater Screening Level		Sample ID: Date: Lab ID: Comments:	2MW01-GW01 2/28/2012 280-26041-3	2MW02-GW01 2/28/2012 280-26041-2	2MW03-GW01 2/29/2012 280-26092-5	2MW04-GW01 2/29/2012 280-26092-2	2MW04-GW01A 2/29/2012 280-26092-3 Field Duplicate	2MW05-GW01 2/29/2012 280-26092-4	2MW06-GW01 2/29/2012 280-26092-6
METALS										
Cadmium, Dissolved	0.005	MCL	mg/L	0.00014 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium, Total	0.005	MCL	mg/L	0.00014 J	0.00011 J	0.000093 J	0.000073 J	0.000077 J	0.000097 J	0.000096 J
Lead, Dissolved	0.015	MCL	mg/L	0.001 U	0.00052 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead, Total	0.015	MCL	mg/L	0.0023	0.0015	0.0015	0.001	0.001	0.0024	0.0011
Chromium, Hexavalent	0.000043	RSL	mg/L	0.02 U	0.02 UJ*	0.02 U	0.1 UJ*	0.02 UJ*	0.02 U	0.02 U
VOLATILE ORGANIC COMPOUNDS										
1,1,1-Trichloroethane	200	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.066	RSL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	2.4	RSL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	4900	RSL	µg/L	6 U	6 U	6 U	6 U	6 U	1 U	1 U
2-Hexanone	34	RSL	µg/L	5 U	5 U	5 U	5 U	5 U	6 U	6 U
4-Methyl-2-pentanone	1000	RSL	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	12000	RSL	µg/L	30 U*	18 U*	10 U	2.9 J	3 J	5 U	5 U
Benzene	5	MCL	µg/L	1 U	1 U	1 U	1 U	3 J	10 U	10 U
Bromodichloromethane	80 a	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	80 a	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	7	RSL	µg/L	2 U	2 U	2 U	2 U	1 U	1 U	1 U
Carbon disulfide	720	RSL	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	2 U	2 U
Chlorobenzene	100	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	21000	RSL	µg/L	2 U	2 U	2 U	2 U	1 U	1 U	1 U
Chloroform	80 a	MCL	µg/L	0.36 J	0.35 J	1 U	0.24 J	0.25 J	2 U	2 U
Chloromethane	190	RSL	µg/L	2 U	2 U	2 U	2 U	2 U	1 U	1 U
cis-1,2-Dichloroethene	70	MCL	µg/L	1 U	1 U	1 U	2 U	2 U	2 U	2 U
cis-1,3-Dichloropropene	0.41 b	RSL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	80 a	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	MCL	µg/L	1 U	2.9	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	MCL	µg/L	2 U	2 U	2 U	1 U	1 U	1 U	1 U
Styrene	100	MCL	µg/L	1 U	1 U	1 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	MCL	µg/L	0.51 J	1.7	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.41 b	RSL	µg/L	3 U	3 U	3 U	1 U	1 U	1 U	1 U
Trichloroethene	5	MCL	µg/L	1 U	1 U	1 U	3 U	3 U	3 U	3 U
Vinyl chloride	2	MCL	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	10000	MCL	µg/L	2 U	17	2 U	2 U	2 U	1 U	2 U

Table A-1
SWMUs 2 and 4 Groundwater Sample Results
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Groundwater Screening Level	Sample ID:	2MW01-GW01	2MW02-GW01	2MW03-GW01	2MW04-GW01	2MW04-GW01A	2MW05-GW01	2MW06-GW01
		Date:	2/28/2012	2/28/2012	2/29/2012	2/29/2012	2/29/2012	2/29/2012	2/29/2012
		Lab ID:	280-26041-3	280-26041-2	280-26092-5	280-26092-2	280-26092-3	280-26092-4	280-26092-6
		Comments:					Field Duplicate		

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

J* - Qualified as estimated during QC review.

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

mg/L - milligrams per liter

µg/L - micrograms per liter

MCL - Safe Drinking Water Act Maximum Contaminant Level (USEPA, 2009)

RSL - Regional Screening Level Summary Table (USEPA, November 2011)

U* - Qualified as not detected during QC review.

UJ* - Qualified as estimated at the reporting limit during QC review.

Table A-2
SWMU 13 Surface Material Results for Metals
Pickle Liquor Tanks

*Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri*

Parameter	Soil Screening Level		Sample ID:	13SM01-SS01	13SM01-SS01A	13SM02-SS01	13SM03-SS01	13SM04-SS01	13SM05-SS01	13SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-3	280-26217-4	280-26217-5	280-26217-6	280-26217-7	280-26217-8	280-26217-9
			Comments:		Field Duplicate					
METALS										
Arsenic, Total	24	BVBG	mg/kg	11	14	5	10	6.3	4.9	18
Barium, Total	190000	RSL	mg/kg	260 B	310 B	80 B	150 B	98 B	54 B	170 B
Cadmium, Total	800	RSL	mg/kg	6.2	5	1.1	3.4	2	0.81	6.8
Chromium, Total	1500000	RSL	mg/kg	340	440	68	170	96	89	93
Lead, Total	1531	PRG	mg/kg	390	460	65	100	53	36	840
Mercury, Total	310	RSL	mg/kg	0.68	0.64	0.31	0.086	0.037	0.02 J	0.079
Selenium, Total	5100	RSL	mg/kg	1.1	1	0.91	1.8	1.1	1	0.74
Silver, Total	5100	RSL	mg/kg	0.39	0.54	0.14	0.34	0.18	0.19	0.53

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

B - Constituent was found in the blank sample.

ft bgs - feet below ground surface

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

mg/kg - milligrams per KILOGRAM

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, November 2011)

Table A-3
SWMU 17 Surface Material Results for Metals
Wiremill Rinsewater Neutralization Tank
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID:	17SM01-SS01	17SM02-SS01	17SM03-SS01	17SM04-SS01	17SM05-SS01	17SM05-SS01A	17SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-10	280-26217-11	280-26217-12	280-26217-13	280-26217-14	280-26217-15	280-26217-16
			Comments:						Field Duplicate	
METALS										
Arsenic, Total	24	BVBG	mg/kg	4.7	19	20	4	7	6.7	8.9
Barium, Total	190000	RSL	mg/kg	160 B	220 B	240 B	160 B	290 B	200 B	290 B
Cadmium, Total	800	RSL	mg/kg	3.6	4.6	2.9	2.4	2.4	3	3.8
Chromium, Total	1500000	RSL	mg/kg	250	740	1200	450	940	850	1400
Lead, Total	1531	PRG	mg/kg	130	240	160	69	100	120	230
Mercury, Total	310	RSL	mg/kg	0.11	0.039	0.1	0.035	0.033	0.04	0.068
Selenium, Total	5100	RSL	mg/kg	0.98	0.98	0.79	0.66	0.83	0.78	0.9
Silver, Total	5100	RSL	mg/kg	0.24	0.31	0.42	0.19	0.27	0.26	0.62

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

B - Constituent was found in the blank sample.

ft bgs - feet below ground surface

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

mg/kg - milligrams per KILOGRAM

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)
 PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)
 RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, November 2011)

Table A-4
SWMU 33 Surface Material Results for Metals
Nail Mill Degreasing Area

Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID:	33SM01-SS01	33SM02-SS01	33SM03-SS01	33SM04-SS01	33SM05-SS01	33SM06-SS01
			Date:	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012	3/2/2012
			Depth (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Lab ID:	280-26217-22	280-26217-21	280-26217-20	280-26217-19	280-26217-18	280-26217-17
			Comments:						
METALS									
Arsenic, Total	24	BVBG	mg/kg	12	8.4	9.3	9.2	9.5	8.9
Barium, Total	190000	RSL	mg/kg	350 B	170 B	340 B	330 B	190 B	370 B
Cadmium, Total	800	RSL	mg/kg	2.4	1.5	4.1	4.7	1.9	4.4
Chromium, Total	1500000	RSL	mg/kg	920	1400	1300	950	660	1900
Lead, Total	1531	PRG	mg/kg	120	35	230	240	59	220
Mercury, Total	310	RSL	mg/kg	0.06	0.014 J	0.13	0.074	0.027	0.11
Selenium, Total	5100	RSL	mg/kg	0.65	0.67	1.2	0.76	0.67	1.1
Silver, Total	5100	RSL	mg/kg	0.33 J	0.18 J	0.65	0.46	0.24	0.57

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

B - Constituent was found in the blank sample.

ft bgs - feet below ground surface

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

mg/kg - milligrams per KILOGRAM

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, November 2011)

APPENDIX B
QA/QC Review of Analytical Data

Memorandum



Date: April 27, 2012
To: Sharon Shelton
From: Angie Barber
Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel, Kansas City, MO
Project No. 66252

Groundwater and surface soil samples were collected as part of the additional sampling of Solid Waste Management Units (SWMUs) 2, 4, 13, 17, and 33 at AK Steel in Kansas City, MO (Site). Groundwater samples were collected on February 28-29, 2012 from SWMUs 2 and 4. Surface soil samples were collected on March 2, 2012 from SWMUs 13, 17, and 33. Additionally, investigation-derived waste (IDW) samples were collected on February 29 and March 2, 2012. All samples were submitted to TestAmerica of Arvada, Colorado (TestAmerica) for analysis of one or more of the following parameters:

Parameter	SW-846 Preparation/Analytical Method
Volatile Organic Compounds (VOCs)	5030B/8260B (water) 5035/8260B (soil)
TCLP* VOCs	1311/5030B/8260B (soil)
Metals, Total	3020A/6020A (water)
Lead and Cadmium	
Metals, Dissolved (field filtered)	3005A/6020A (water)
Lead and Cadmium	
RCRA** Metals, Total	3050B/6020A (soil - excl. Mercury)
Arsenic, Barium, Cadmium, Lead, Selenium, Silver,	
Mercury	7471B (soil - Mercury)
TCLP RCRA Metals, Total	1311/3010A/6010B (excl. Mercury)
TCLP Mercury	1311/7470A (Mercury)
Hexavalent Chromium, Dissolved (field filtered)	7196A (water)

Note:

*TCLP = Toxicity Characteristic Leaching Procedure

**RCRA = Resource Conservation Recovery Act

The QA/QC results in association with the samples collected were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in United States Environmental Protection Agency's (USEPA's) *National Functional Guidelines for Inorganic Superfund Data Review* (NFGI, 2010) and *National Functional Guidelines for Superfund Organic Methods Data Review* (NFGO, 2008). The QA/QC review results are discussed below. Table 1 presents data qualifiers added as a result of this QA/QC review.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates on the COC were present and properly signed.
2. Requested Analyses Completed – All analyses were completed as requested.

Memorandum *(continued)*



April 27, 2012

Page 2

3. Holding Times – All samples were analyzed within the recommended method holding times.
4. Sample Preservation – Two sample coolers were received by TestAmerica slightly below the 4 degrees Celsius ($^{\circ}\text{C}$) $\pm 2^{\circ}\text{C}$ sample preservation temperature range. Because no samples were received in a frozen state, impact was negligible and data qualification was not necessary. Upon arrival at the lab, all samples were logged-in, placed in the laboratory cooler, and kept at temperatures between 2 and 6 $^{\circ}\text{C}$.

One of three volatile organic analysis (VOA) vials was received broken for LIQUID IDW/GW01 (lab identification [ID] 280-26217-2). Sufficient volume remained for the requested analyses and no data qualifiers were added.

5. Laboratory Method Blanks – Target analytes were detected in the following method blanks:
 - VOC QC Batch 280-110348 – Carbon disulfide was detected (1.22 J micrograms per kilogram [$\mu\text{g}/\text{kg}$]) in the method blank. Associated detections less than five times the method blank concentration were qualified as undetected (U*) to account for potential cross-contamination. SOIL IDW DRUM 4 (lab ID 280-26093-5) received this qualification for carbon disulfide. All other associated samples were non-detect (U) for carbon disulfide.
 - VOC QC Batch 280-110574 – Methylene chloride was detected (0.525 J micrograms per liter [$\mu\text{g}/\text{L}$]) in the method blank. Associated results less than ten times the trip blank detection for this common laboratory contaminant were qualified as undetected (U*). As a result, methylene chloride was qualified as undetected (U*) in LIQUID IDW/GW01 (lab ID 280-26217-2). Note, trip blanks are generally not qualified based on a method blank detection; as such, TB03022012A/GW01 (lab ID 280-26217-1TB) received no qualification for methylene chloride.
 - Metals QC Batch 280-110264 – Barium was detected (110 J $\mu\text{g}/\text{kg}$) in the method blank. All associated detections were greater than five times the method blank detections, and data qualification was not necessary.
 - TCLP Metals QC Batch 280-110436 – Arsenic, barium, and lead were detected in the method blank at 0.0328 J milligrams per liter [mg/L], 0.0108 J mg/L , and 0.0136 J mg/L , respectively. The associated arsenic detection was less than five times the method blank detection, and was qualified as undetected (U*) as a result. Because the associated barium and lead results were greater than five times the method blank detections, data qualification was not necessary for these analytes.

All other method blanks were non-detect for target analytes.

6. Trip Blanks – Acetone and methylene chloride were detected in TB03022012A/GW01 (lab ID 280-26217-1TB) at 6.8 J $\mu\text{g}/\text{L}$ and 0.95 J B $\mu\text{g}/\text{L}$, respectively. Associated results less than ten times the trip blank detection for these common laboratory contaminants were qualified as undetected (U*). As such, methylene chloride in LIQUID IDW/GW01 (lab ID 280-26217-2)

Memorandum (continued)



April 27, 2012
Page 3

received this qualification. Note, this sample was also qualified as undetected (U*) based on a laboratory method blank detection of methylene chloride. Because the associated detection of acetone was greater than ten times the trip blank concentration, cross-contamination was not likely and data qualification as not necessary.

All other trip blanks were non-detect for target analytes.

7. Rinsate Blanks – Acetone was detected in 2MW01/GW01ERB (lab ID 280-26041-4EB) at 7.8 J ug/L. Associated results less than ten times the rinsate blank detection for this common laboratory contaminant were qualified as undetected (U*). These include the following samples: 2MW01/GW01 (lab ID 280-26041-3) and 2MW02/GW01 (lab ID 280-26041-2).

All other rinsate blanks were non-detect for target analytes.

8. Surrogates – Surrogates are added for organic analyses. Surrogates are compounds not normally found in the environment that are added (spiked) into samples and analyzed for percent recovery (REC). The laboratory sets maximum and minimum limits on the REC for the method used.

All surrogate RECs were within their respective QC limits with exception of the following:

- SOIL IDW DRUM 1 (lab ID 280-26093-2) – VOC surrogates toluene-d8 and 4-bromofluorobenzene had RECs above their respective QC limits. To account for potential high bias, all detected VOCs in the associated sample were qualified as estimated (J*). All associated non-detect results did not receive qualification since high bias was not a concern.
 - SOIL IDW DRUM 2 (lab ID 280-26093-3) – VOC surrogate dibromofluoromethane had a REC below the QC limit. To account for potential low bias, all detected VOCs in the associated sample were qualified as estimated (J*), and all associated non-detect results were qualified as estimated at the reporting limit (UJ*).
 - SOIL IDW DRUM 3 (lab ID 280-26093-4) – VOC surrogate 4-bromofluorobenzene had a REC above the QC limit. To account for potential high bias, all detected VOCs in the associated sample were qualified as estimated (J*). All associated non-detect results did not receive qualification since high bias was not a concern.
9. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) – The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine REC. The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. In some instances, the laboratory also reported a LCSD. The relative percent difference (RPD) between the LCS/LCSD RECs was calculated to determine analytical precision.

All LCS/LCSD RECs and/or RPDs were within their respective QC limits.

Memorandum *(continued)*



April 27, 2012

Page 4

10. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike.

All MS/MSD RECs and RPDs were within their respective QC limits except the following:

- Metals QC Batches 280-110264 and 280-110498 – MS/MSDs was performed on 33SM03/SS01/0-0.5' (lab ID 280-26217-20) and SOIL IDW DRUM COMPOSITE (lab ID 280-26093-1), respectively. MS/MSD RECs and/or RPDs were outside of QC limits for barium, chromium, and lead; however, the spike concentrations were less than one-fourth the respective parent sample concentrations for these analytes. As a result, no conclusion could be made regarding the accuracy of the MS/MSD spikes and no data qualifiers were added.
- Dissolved Hexavalent Chromium QC Batch 280-109635 – MS/MSD was performed on 2MW02/GW01 (lab ID 280-26041-2). MS/MSD RECs for dissolved hexavalent chromium were less than the QC limits. The associated non-detect result was qualified as estimated at the reporting limit (UJ*) to account for potential low bias.
- Dissolved Hexavalent Chromium QC Batch 280-109844 – MS/MSD was performed on 2MW04/GW01 (lab ID 280-26092-2). MS/MSD RECs for dissolved hexavalent chromium were less than the QC limits. The associated non-detect result was qualified as estimated at the reporting limit (UJ*) to account for potential low bias. Furthermore, the associated field duplicate 2MW04/GW01A (lab ID 280-26092-3) was also qualified as estimated at the reporting limit (UJ*) since both samples are collected from the same location and any matrix interference is expected to be present in both samples. Note, SW-846 Method 7196A requires the sample to be diluted until the MS REC is within 85-115 percent in order to verify the absence of a matrix interference. As such, the laboratory performed analysis of this sample at a dilution of two and five times. The five times dilution and associated MS/MSD results is the only dilution reported in the analytical data package.

For those QC Batches which did not have sufficient sample volume for project-specific MS/MSDs, precision and accuracy were assessed by review of the associated surrogate, LCS/LCSD, and/or laboratory duplicate results. No qualifiers were added based on these omissions.

11. Field Duplicate Results – Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:

Memorandum (continued)



April 27, 2012

Page 5

- Is the compound detected in both portions?
- If the sample concentrations are greater than five times the detection limit, then the maximum allowable RPD is 20 percent for water samples and 35 percent for soil samples.
- If the sample concentrations are less than five times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within plus or minus (\pm) the lower detection limit for water samples and within \pm two times the lower detection limit for soil samples.

The following field duplicate pairs were collected and reviewed:

- 2MW04/GW01 (lab ID 280-26092-2) and 2MW04/GW01A (lab ID 280-26092-3) – All analytes were adequately replicated.
- 13SM01/SS01/0-0.5' (lab ID 280-26217-3) and 13SM01/SS01/0-0.5'A (lab ID 280-26217-4) – All analytes were adequately replicated.
- 17SM05/SS01/0-0.5' (lab ID 280-26217-14) and 17SM05/SS01/0-0.5'A (lab ID 280-26217-15) – All analytes were adequately replicated with the following exception. The RPD for barium slightly exceeded the QC criteria.

Table 2 presents the results of the field duplicate review. Overall, the field duplicate review was qualitative in nature. No data qualifiers were applied to the data based on the field duplicate review.

12. Laboratory Duplicate Results – Laboratory duplicate analyses were performed for dissolved hexavalent chromium and percent moisture. All laboratory duplicate results met the QC criteria.
13. Detection and Quantitation Limits – Table 3 presents the analyses that required a dilution to bring concentrations of target analytes within the calibration range and/or to account for matrix interference(s). These dilutions resulted in an elevated reporting limit.
14. Method Requirements – TestAmerica flagged any detection between the method detection limit (MDL) and the practical quantitation limit (PQL [reported as the reporting limit by TestAmerica]) with a "J" to indicate the reported value was estimated. Any detection reported with this "J" qualifier should be used as reported by the lab, unless otherwise noted during this QA/QC evaluation. The majority of these estimated trace detection results were closer to the MDL than the PQL. Approximately half of these trace J-flags were on VOCs and the other half were on metals.
15. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. Data qualifiers added as a result of this review are included on Table 1. No data were rejected (R). The data are valid for use, as qualified, in reporting the results of this investigation.

Memorandum *(continued)*



April 27, 2012

Page 6

Attachments

Table 1 – Data Qualifiers

Table 2 – Field Duplicate Results

Table 3 – Dilution Factors

Table 1
Data Qualifiers
Additional Sampling at SWMUs 2, 4, 13, 17, and 33
AK Steel, Kansas City, Missouri

Sample Point	Laboratory Number	Analysis	Target Analyte	Qualifier Added	Reason(s) for Qualification
2MW01/GW01	280-26041-3	VOC	Acetone	U*	Result less than ten times rinsate blank detection.
2MW02/GW01	280-26041-2	VOC	Acetone	U*	Result less than ten times rinsate blank detection.
		CR(VI)	Chromium, hexavalent-dissolved	UJ*	MS/MSD RECs below QC limits.
2MW04/GW01	280-26092-2	CR(VI)	Chromium, hexavalent-dissolved	UJ*	MS/MSD RECs below QC limits.
2MW04/GW01A (duplicate of 2MW04/GW01)	280-26092-3	CR(VI)	Chromium, hexavalent-dissolved	UJ*	MS/MSD RECs below QC limits.
LIQUID IDW/GW01	280-26217-2	VOC	Methylene chloride	U*	Result less than ten times method blank and trip blank detections.
SOIL IDW DRUM COMPOSITE	280-26093-1	TCLP METAL	Arsenic	U*	Result less than five times method blank detection.
SOIL IDW DRUM 1	280-26093-2	VOC	Acetone 2-Butanone Toluene	J* J* J*	VOC surrogate RECs above QC limits.
SOIL IDW DRUM 2	280-26093-3	VOC	Acetone Benzene 2-Butanone Carbon disulfide Chloroform 1,2-Dichloroethane 1,1-Dichloroethene Ethylbenzene Toluene Xylenes, Total All other VOCs	J* J* J* J* J* J* J* J* J* J* UJ*	VOC surrogate REC below QC limits.
SOIL IDW DRUM 3	280-26093-4	VOC	Acetone 2-Butanone Toluene	J* J* J*	VOC surrogate REC below QC limits.
SOIL IDW DRUM 4	280-26093-5	VOC	Carbon disulfide	U*	Result less than five times method blank detection.

Notes:
CR(VI) = Hexavalent Chromium, Dissolved
J* = Qualified as estimated during QC review
MS/MSD = Matrix spike/Matrix spike duplicate
QC = Quality control
REC = Percent recovery
TCLP METAL = Metals after Toxicity Characteristic Leaching Procedure
U* = Qualified as not detected during QC review
UJ* = Qualified as estimated at the reporting limit during QC review
VOC = Volatile Organic Compound

Table 2
Field Duplicate Results
Additional Sampling at SWMUs 2, 4, 13, 17, and 33
AK Steel, Kansas City, Missouri

Sample Identification:		2MW04/GW01	2MW04/GW01A	Meets
Date Sampled:		2/29/2012	2/29/2012	QC
Laboratory Number:		280-26092-2	280-26092-3	Criteria
Volatile Organic Compounds (VOCs)				
Acetone	ug/L	2.9 J	3.0 J	Yes
Chloroform	ug/L	0.24 J	0.25 J	Yes
All other VOCs	ug/L	Not detected (U)	Not detected (U)	Yes
Metals, Dissolved				
Cadmium, Dissolved	ug/L	1.0 U	1.0 U	Yes
Lead, Dissolved	ug/L	1.0 U	1.0 U	Yes
Metals, Total				
Cadmium, Total	ug/L	0.073 J	0.077 J	Yes
Lead, Total	ug/L	1.0	1.0	Yes
Hexavalent Chromium				
Chromium, hexavalent-dissolved	mg/L	0.1 UJ*	0.02 UJ*	Yes

Sample Identification:		13SM01/SS01/0-0.5'	13SM01/SS01/0-0.5'A	Meets
Date Sampled:		3/2/2012	3/2/2012	QC
Laboratory Number:		280-26217-3	280-26217-4	Criteria
Metals, Total				
Arsenic, Total	mg/kg	11	14	Yes
Barium, Total	mg/kg	260	310	Yes
Cadmium, Total	mg/kg	6.2	5.0	Yes
Chromium, Total	mg/kg	340	440	Yes
Lead, Total	mg/kg	390	460	Yes
Mercury, Total	mg/kg	0.68	0.64	Yes
Selenium, Total	mg/kg	1.1	1.0	Yes
Silver, Total	mg/kg	0.39	0.54	Yes

Sample Identification:		17SM05/SS01/0-0.5'	17SM05/SS01/0-0.5'A	Meets
Date Sampled:		3/2/2012	3/2/2012	QC
Laboratory Number:		280-26217-14	280-26217-15	Criteria
Metals, Total				
Arsenic, Total	mg/kg	7.0	6.7	Yes
Barium, Total	mg/kg	290	200	No, RPD = 36.7%
Cadmium, Total	mg/kg	2.4	3.0	Yes
Chromium, Total	mg/kg	940	850	Yes
Lead, Total	mg/kg	100	120	Yes
Mercury, Total	mg/kg	0.033	0.040	Yes
Selenium, Total	mg/kg	0.83	0.78	Yes
Silver, Total	mg/kg	0.27	0.26	Yes

Notes:

Bold/Italics = QC criteria not met. See text for explanation.

J = Qualified as estimated (trace value - lab qualifier)

mg/kg = milligrams per kilogram

mg/L = milligrams per Liter

QC = Quality Control

RPD = Relative Percent Difference

U = compound was not detected

ug/L = micrograms per Liter

UJ* = qualified as estimated at the reporting limit during QC review

Table 3
Dilution Factors
Additional Sampling at SWMUs 2, 4, 13, 17, and 33
AK Steel, Kansas City, Missouri

Sample Identification	Laboratory Number	Parameter	Dilution Factor
2MW04/GW01	280-26092-2	Chromium, hexavalent-dissolved	5
33SM01/SS01/0-0.5'	280-26217-22	Barium, Total Cadmium, Total Lead, Total Silver, Total	5
33SM02/SS01/0-0.5'	280-26217-21	Barium, Total Cadmium, Total Lead, Total Silver, Total	5
33SM03/SS01/0-0.5'	280-26217-20	Barium, Total Cadmium, Total Silver, Total	5
33SM06/SS01/0-0.5'	280-26217-17	Chromium, Total	20
SOIL IDW DRUM COMPOSITE	280-26093-1	Barium, Total Cadmium, Total Chromium, Total Lead, Total Selenium, Total Silver, Total	5

Appendix C
Monitoring Well Information

Drilling Log

Project Name AK Steel		Project Number 66252		Boring Number 2mw01	
Ground Elevation		Location Kansas City, mo		Page 1/4	
Air Monitoring Equipment PED + LEL				Total Footage 50	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Roto-Sonic	8" casing 4" sampler	50	NA	NA	NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig Geoprobe 8140DT			Type of Sampler 5'x4" sampler		
Date 2/20/12		To 2/20/12		Field Observer(s) Justin Carher	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SILT & Slag Gravel (Fill), Dark grayish brown 4/2 104R, dry soft, non plastic	Fill	NA	2.1 3.0			PED	O ₂	LEL	
2					1427	NA	0	20.9	0	
3							0	20.9	0	
4	SILT & Slag Gravel (Fill), Dark grayish brown 4/2 104R, dry soft, non plastic	Fill	NA	2.0 2.0		NA	0	20.9	0	
5					1435		0	20.9	0	
6							0	20.9	0	
7	CLAY & SILT, dark gray 3/1 104R moist, soft-medium, highly plastic	Fill	NA	1.0 5.0		NA	0	20.9	0	
8							0	20.9	0	
9					1445		0	20.9	0	
10	CLAY & SILT, dark gray 3/1 104R moist, soft-medium, highly plastic	CH	NA	4.9 5.0		NA	0	20.9	0	
11							0	20.9	0	
12							0	20.9	0	
13	CLAY & SILT, dark gray 3/1 104R moist, soft-medium, highly plastic	CH	NA				0	20.9	0	
14					1450		0	20.9	0	

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

Project Name Ak Steel						Boring Number 2mw01				
Project Number 66252						Page 2/84				
						Date 2/20/2012				
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	CLAY & SILT, dark gray 3/1 10YR moist, soft-medium, highly plastic	CH					PED	0.2	LEL	
16		CH					0	20.9	0	
17		CH	NA	5.0 5.0		NA	0	20.9	0	
18		SILT some CLAY, dark gray 3/1 10YR, moist, medium highly plastic	MH				0	20.9	0	
19						0	20.9	0		
20				1500		0	20.9	0		
21						0	20.9	0		
22		MH	NA	2.2 5.0		NA	0	20.9	0	
23						0	20.9	0		
24						0	20.9	0		
25				1505		0	20.9	0		
26	SILT trace CLAY, dark gray 3/1 10YR, moist, medium, highly plastic	MH	NA	5.0 5.0		NA	0	20.9	0	
27						0	20.9	0		
28						0	20.9	0		
29						0	20.9	0		
30							0	20.9	0	
31		MH	NA	4.1 5.0		NA	0	20.9	0	
32					1520					

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Project Name <u>Ak Steel</u>							Boring Number <u>2MW01</u>			
Project Number <u>66282</u>							Page <u>3/4</u>			
							Date <u>2/20/12</u>			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
33	SILT trace clay, dark gray 3/1 104R, moist, medium, highly plastic	MH					PID	O ₂	LEC	
0							20.9	0		
0							20.9	0		
34							0	20.9	0	
35							0	20.9	0	
36		MH					0	20.9	0	
37			NA	4.6 5.0		NA	0	20.9	0	
38	SILT + SAND, gray 5/1 104R moist-wet, too soft, trace- medium plastic	CL					0	20.9	0	
0							20.9	0		
0							20.9	0		
39					1500		0	20.9	0	
40							0	20.9	0	
41							0	20.9	0	
42		CL	NA	4.3 5.0		NA	0	20.9	0	
43							0	20.9	0	
44							0	20.9	0	
45					1520		0	20.9	0	
46							0	20.9	0	
47		CL	NA	4.7 5.0		NA	0	20.9	0	
48							0	20.9	0	
49							0	20.9	0	
50					1530					

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Boring Number **2mw01**

Page **4/4**

Date **2/20/12**

Project Name **AK Steel**

Project Number **66252**

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
	Above Grade Completions									
	2.52' {									
	Ground Surface									
	Concrete									
	Enviro Plug									
	3/8" medium									
	chip 200 lbs									
	30' of bentonite									
	Filter Pack									
	Filter S:1									
	20/40 Grade									
	Sand 250 lbs									
	13' of sand									
	Screen - 10.00'									
	0.010' slot									
	Sch 40 Flush									
	Thread									
	TD - 47.73									
	End Cap - 0.21'									
	Sand 1'									
	Bentonite 4'									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log

Project Name Ak Steel		Project Number 66252		Boring Number 2mw02	
Ground Elevation		Location Kansas City, MO		Page 1/3	
Air Monitoring Equipment PID & LEL				Total Footage 30	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Rotor Sonic	8" casing 4" sampler	30	NA	NA	NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig Geoprobe 8140 DT			Type of Sampler 5' x 4" sampler		
Date 2/21/12		To 2/21/12		Field Observer(s) Justin Carter	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SILT & SLAG Gravel (Fill) dark grayish brown 4/2 104R, dry soft, non plastic	Fill	NA	2.5 3.0	0847	NA	PID 02	02	LEL	
2							0	20.9	0	
3							0	20.9	0	
4	SILT dark gray 4/1 104R, dry very stiff, trace plastic	Fill	NA	2.0 2.0	0855	NA	0	20.9	0	
5							0	20.9	0	
6							0	20.9	0	
7	SILT, trace sand, dark gray 4/1 104R, damp, stiff, trace plastic	ML	NA	4.2 5.0	0910	NA	0	20.9	0	
8							0	20.9	0	
9							0	20.9	0	
10		ML	NA	4.4 5.0	0915	NA	0	20.9	0	
11							0	20.9	0	
12							0	20.9	0	
13							0	20.9	0	
14							0	20.9	0	

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

Project Name Ak steel						Boring Number 2MW02				
Project Number 66252						Page 2/3				
						Date 2/21/12				
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	SILT trace sand, dark gray 4/104R, damp, stiff, trace plastic	ML					PID	O ₂	LEL	
16		ML					0	20.9	0	
17	SILT & SAND, dark gray 4/1, 104R, moist, soft, non plastic	NA	4.8 5.0	0925	NA		0	20.9	0	
18						0	20.9	0		
19						0	20.9	0		
20						0	20.9	0		
21										
22		ML	NA	4.4 5.0	0945	NA		0	20.9	0
23							0	20.9	0	
24							0	20.9	0	
25							0	20.9	0	
26		ML	NA	4.6 5.0	1000	NA		0	20.9	0
27	SAND, trace SILT dark gray 4/104R, wet, loose, fine grained well rounded, poorly graded	SM					0	20.9	0	
28							0	20.9	0	
29							0	20.9	0	
30	Bottom of borehole									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Project Name Ak Steel						Boring Number 2MW92				
Project Number 66252						Page 3/3				
Date 2/21/12										
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
	Above Grade Completion									
	2.58' {									
	Ground Surface									
	Concrete									
	Riser - 22.57'									
	Sch 40 Flush									
	Thread									
	Enviroplug XX									
	3/8" medium XX									
	Chip 150 lbs XX									
	B.S. of XX									
	bentonite XX									
	XX									
	XX									
	XX									
	XX									
	XX									
	XX									
	Filter Pack									
	Filter Sil									
	20/40 Grade									
	Sand 250 lbs									
	14.5' of sand									
	Screen - 10.00									
	0.010' slot									
	Sch 40 Flush									
	Thread									
	TD - 32.75									
	End Cap - 0.18									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log

Project Name AK Steel		Project Number 66252		Boring Number 2mw03	
Ground Elevation		Location Kansas City, MO		Page 1/3	
Air Monitoring Equipment PID & LEL				Total Footage 30	
Drilling Type Rotary - Sonic	Hole Size 8" casing 4" sampler	Overburden Footage 30	Bedrock Footage NA	No. of Samples NA	No. of Core Boxes NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig 620 probe 8140 DT			Type of Sampler 5' 4" sampler		
Date 2/22/12		To 2/22/12		Field Observer(s) Justin Coker	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SILT & slag gravel, dark grayish brown 1/2 to 1/4", damp, soft, non plastic	Fill	NA	4.0 / 5.0	0944	NA	PID 02	LEL		
0							20.9	0		
0							20.9	0		
0							20.9	0		
2										
3										
4										
5										
6	SILT & CLAY, very dark gray 3/16 to 1/4", damp, highly plastic	MH	NA	5.6 / 5	0949	NA	0	20.9	0	
0							20.9	0		
0							20.9	0		
0							20.9	0		
7										
8										
9										
10										
11										
12	SILT some clay very dark gray 3/16 to 1/4", damp, highly plastic	MH	NA	4.2 / 5.0	0953	NA	0	20.9	0	
13							0	20.9	0	
14										

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

						Boring Number 2mw03				
Project Name AK Steel						Page 2/3				
Project Number 66252						Date 2/22/12				
Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	SILT, dark gray 4/1 104R, moist, soft, highly plastic	MH					PED	O ₂	LEL	
16							0	20.9	0	
17		MH	NA	5.0 5.0	1000	NA	0	20.9	0	
18							0	20.9	0	
19										
20							0	20.9	0	
21		MH	NA	4.4 5.0	1005	NA				
22	trace sand & gravel						0	20.9	0	
23	SILT, dark gray 4/1 104R, wet, soft, highly plastic	MH								
24							0	20.9	0	
25										
26		MH	NA	4.4 5.0	1012	NA				
27							0	20.9	0	
28	SAND trace silt, dark gray 4/1 104R, wet, loose fine grained, well rounded	SM								
29	poorly graded						0	20.9	0	
30	Bottom of borehole									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Project Name AK Steel						Boring Number 2MW03				
Project Number 66252						Page 3/3				
						Date 2/22/12				
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
	Above Grade Completion									
	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">254 {</div> <div style="border-left: 1px solid black; height: 100px; position: relative;"> <div style="position: absolute; top: 0; right: 0;">Ground Surface</div> <div style="position: absolute; top: 10%; right: 0;">Concrete</div> <div style="position: absolute; top: 30%; left: 10%;"> Enviroplug 3/8" medium chip. 150 lbs 4' of bentonite </div> <div style="position: absolute; top: 35%; left: 20%;"> Riser - 22.54' Sch 40 Flush Thread </div> <div style="position: absolute; top: 58%; left: 10%;"> Filter Pack Filter Sil 20/40 grade sand 200 lbs 14' of sand </div> <div style="position: absolute; top: 64%; left: 20%;"> Screen - 10.00 0.010" slot Sch 40 Flush Thread </div> <div style="position: absolute; bottom: 0; left: 0;">TD - 32.72</div> <div style="position: absolute; bottom: 0; right: 0;">End Cap - 0.18'</div> </div> </div>									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log

Project Name AK Steel		Project Number 66252		Boring Number 2mw04	
Ground Elevation		Location Kansas City, MO		Page 1/3	
Air Monitoring Equipment PID & LEL				Total Footage 30	
Drilling Type Roto-Sonic	Hole Size 8" Casings 4" Sampler	Overburden Footage 30	Bedrock Footage NA	No. of Samples NA	No. of Core Boxes NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig Geoprobe 8140 DT			Type of Sampler 5' x 4" sampler		
Date 2/21/12		To 2/21/12		Field Observer(s) Justin Calver	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SILT & SLAG Gravel (Fill) dark grayish brown 4 1/2 104R, damp soft, non plastic	Fill	NA	3.4 / 5.0	NA	NA	PID	O ₂	LEL	
2							0	20.9	0	
3							0	20.9	0	
4	SILT & CLAY, very dark gray 3 1/2 104R damp, medium, highly plastic	MH	NA	9 / 5.0	NA	NA	0	20.9	0	
5							0	20.9	0	
6	NO RECOVERY	NA	NA	9 / 5.0	NA	NA	0	20.9	0	
7							0	20.9	0	
8							0	20.9	0	
9							0	20.9	0	
10	SILT, dark gray 4 1/2 104R, damp-moist, soft-medium, highly plastic	MH	NA	3.8 / 5.0	NA	NA	0	20.9	0	
11							0	20.9	0	
12							0	20.9	0	
13							0	20.9	0	
14					1200					

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

Project Name AK Steel							Boring Number 2MW04			
Project Number 66252							Page 2/3			
							Date 2/21/12			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	SILT, dark gray 4/1 104R, dmp- moist, soft-medium, highly plastic	MH					PED	O ₂	LEL	
16							0	20.9	0	
17	SILT + SAND, dark gray 4/1 104R moist, soft, trace plastic	ML	NA	4.2 5.0		NA	0	20.9	0	
18							0	20.9	0	
19	SAND some SILT, dark gray 4/1 104R, Net, loose, fine grained	SM					0	20.9	0	
20	well rounded, poorly graded				1212					
21		SM	NA	4.6 5.0		NA	0	20.9	0	
22							0	20.9	0	
23							0	20.9	0	
24							0	20.9	0	
25					1221		0	20.9	0	
26		SM	NA	4.3 5.0		NA	0	20.9	0	
27							0	20.9	0	
28							0	20.9	0	
29							0	20.9	0	
30					1230					
	Bottom of borehole									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Project Name Ak steel						Boring Number 2MW04				
Project Number 66252						Page 3/3				
Date 2/21/12										
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
	Above Grade Completion									
	2.54' {									
	Ground Surface									
	Concrete									
	Riser - 22.55									
	Sch 40 Flush Thread									
	Enviro plug									
	3/8" medium									
	chip 150 lbs									
	14' of bentonite									
	Filter Pack									
	Filter Sil									
	20/40 Grade									
	Sand 225 lbs									
	14' of sand									
	Screen - 10.00									
	0.010" slot									
	Sch 40 Flush Thread									
	TD - 32.73									
	End Cap - 2.18									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log

Project Name Ak Steel		Project Number 60252		Boring Number 2MW05	
Ground Elevation		Location Kansas City, MO		Page 1/3	
Air Monitoring Equipment PED & LEL				Total Footage 30	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Roto-Sonic	8" casing 4" sampler	30	NA	NA	NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig Geoprobe 8140 DT			Type of Sampler 5' x 4" sampler		
Date 2/22/12		To 2/22/12		Field Observer(s) Justin Carver	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SILT & SLT gravel, dark grayish brown 4/2 104R, damp soft, non plastic	Fill	NA	2.7 3	1347	NA	PID	02	LEL	
2							0	20.9	0	
3							0	20.9	0	
4	SILT trace clay, very dark gray 3/1 104R, damp, soft- medium, highly plastic	MH	NA	1.2 2.0	1350	NA	0	20.9	0	
5							0	20.9	0	
6							0	20.9	0	
7		MH	NA	4.5 5.0	1358	NA	0	20.9	0	
8							0	20.9	0	
9							0	20.9	0	
10		MH	NA	4.4 5.0	1406	NA	0	20.9	0	
11							0	20.9	0	
12							0	20.9	0	
13	SAND trace clay, very dark gray 3/1 104R, moist, loose fine grained well rounded poorly graded	SM					0	20.9	0	
14							0	20.9	0	

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

Project Name AK Steel							Boring Number 20 2MW05			
Project Number 662S2							Page 2/3			
							Date 2/22/12			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	SAND, trace clay, very dark gray 3/1 104R, moist, loose, fine grained, well rounded, poorly graded	SM					PED	92	LEC	
16		SM					0	20.9	0	
17	SELT dark gray 4/1 104R, moist, soft, highly plastic	MH	NA	4.6 5.0		NA	0	20.9	0	
18							0	20.9	0	
19	SELT trace sand, dark gray 4/1 104R, moist, soft, medium plastic	MH			1412		0	20.9	0	
20										
21		MH	NA	4.1 5.0		NA	0	20.9	0	
22							0	20.9	0	
23										
24	SAND, trace silt, dark gray 4/1 104R, wet, loose, fine grained, well rounded, poorly graded	SM			1418		0	20.9	0	
25		SM					0	20.9	0	
26										
27	SELT some sand, dark gray 4/1 104R, wet, soft, trace plastic	ML	NA	4.6 5.0		NA	0	20.9	0	
28							0	20.9	0	
29					1423		0	20.9	0	
30										
	Bottom of borehole									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

[illegible]

Drilling Log

Project Name AK Steel		Project Number 66252		Boring Number 2mw06	
Ground Elevation		Location Kansas City, MO		Page 1/3	
Air Monitoring Equipment PID & LEL				Total Footage 30	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Roto Sonic	8" casing 4" sampler	30	NA	NA	NA
Drilling Company WDC			Driller(s) Russ Gordon		
Drilling Rig Geoprobe 8140DT			Type of Sampler 5' x 4" sampler		
Date 2/22/12		To 2/22/12		Field Observer(s) Justin Carher	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	SLT & SLAG Gravel (Fill), dark grayish brown 4/2 104R, damp soft, non plastic	Fill	NA	3.2 5.0		NA	PID 02	LEL		
0							20.9	0		
0							20.9	0		
2							0	20.9	0	
3							0	20.9	0	
4	SLT, dark gray 4/1 104R, damp, medium, highly plastic	MH			0734		0	20.9	0	
5										
6							0	20.9	0	
7		MH	NA	3.9 5.0		NA	0	20.9	0	
8							0	20.9	0	
9							0	20.9	0	
10					0740		0	20.9	0	
11		MH	NA	4.6 5.0		NA	0	20.9	0	
12							0	20.9	0	
13							0	20.9	0	
14					0745		0	20.9	0	

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-2-1

Drilling Log Continuation

							Boring Number 2mw06			
Project Name AK Steel							Page 2/3			
Project Number 66252							Date 2/22/12			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	SILT, dark gray 4/1 104R, damp medium, highly plastic	MN					PED	0.2	LEL	
16	becoming moist	MH					0	20.9	0	
17			NA	4.8 5.0		NA	0	20.9	0	
18	SILT, dark gray 4/1 104R, moist, soft medium plastic						0	20.9	0	
19					0750		0	20.9	0	
20		CL	NA	3.6 4.0		NA	0	20.9	0	
21							0	20.9	0	
22	SILT, trace sand, dark gray 4/1 104R, wet, soft, medium-high plastic	CL					0	20.9	0	
23					0757		0	20.9	0	
24		CL	NA	4.8 5.0		NA	0	20.9	0	
25							0	20.9	0	
26							0	20.9	0	
27							0	20.9	0	
28							0	20.9	0	
29							0	20.9	0	
30					0803					
	Bottom of borehole									

BZ=Breathing Zone

BH=Bore Hole

S=Sample



051601 Form WCD-KC-2-2

Drilling Log Continuation

Boring Number 2mw06

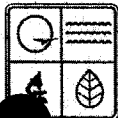
Project Name AK Steel

Page 2/22/12 3/3

Project Number 66252

Date 2/22/12

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
	Above Grade Completion									
	2.91' {									
	Ground Surface									
	Concrete									
	Enviro Plug									
	3/8" medium									
	chip, 150 lbs									
	14' of bentonite									
	Filter Pack									
	Filter S:1									
	20/40 Grade Sand									
	14' of sand									
	TD- 32.97									
	End Cap - 0.18									
	Screen - 9.99'									
	0010' slot									
	Sch 40 Flush Thread									
	Riser - 20.8									
	22.80									
	Sch 40 Flush Thread									



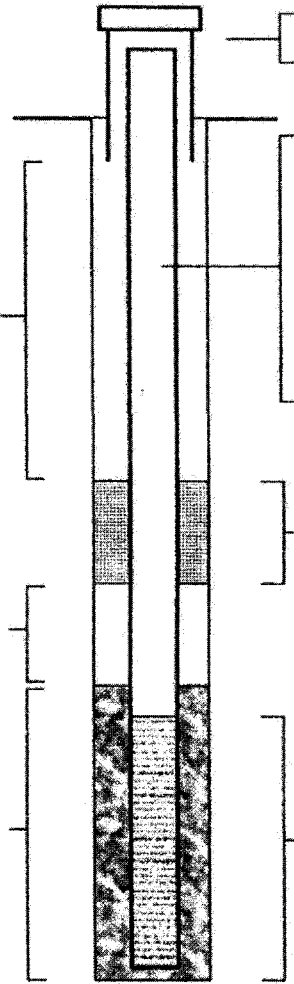
MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY			DATE RECEIVED	
REFERENCE NO.			CHECK NO.	
C.R. NO.				
STATE WELL NUMBER			REVENUE NO.	
ENTERED Ph1 Ph2 Ph3			APPROVED BY	ROUTE

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

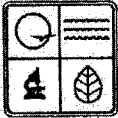
NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levensgood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW01		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION		DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED		SURFACE COMPLETION GROUT		LOCATION OF WELL (D/M/S FORMAT ONLY)	
TYPE <input checked="" type="checkbox"/> ABOVE GROUND <input type="checkbox"/> FLUSH MOUNT	LENGTH AND DIAMETER OF SURFACE COMPLETION LENGTH <u>5</u> FT. DIAMETER <u>4</u> IN.	DIAMETER <u>6</u> IN. LENGTH <u>3</u> FT.		<input checked="" type="checkbox"/> CONCRETE <input type="checkbox"/> OTHER		LAT. _____ ° _____ ' _____ " _____" LONG. _____ ° _____ ' _____ " _____"	
<input checked="" type="checkbox"/> LOCKING CAP <input type="checkbox"/> WEEP HOLE				SURFACE COMPLETION <input checked="" type="checkbox"/> STEEL <input type="checkbox"/> ALUMINUM <input type="checkbox"/> PLASTIC		SMALLEST _____ LARGEST _____ SECTION _____ TOWNSHIP _____ NORTH RANGE _____ <input type="checkbox"/> EAST <input type="checkbox"/> WEST	
ELEVATION <u>745.96</u> FT.				RISER RISER PIPE DIAMETER <u>2</u> IN. RISER PIPE LENGTH <u>38</u> FT. DIAMETER OF DRILL HOLE <u>6</u> IN. WEIGHT OR SDR# _____		MONITORING FOR: (CHECK ALL THAT APPLY) <input type="checkbox"/> RADIONUCLIDES <input type="checkbox"/> PETROLEUM PRODUCTS ONLY <input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> METALS <input type="checkbox"/> VOC <input type="checkbox"/> SVOCs <input type="checkbox"/> PESTICIDES/HERBICIDES	
ANNULAR SEAL LENGTH _____ FT. <input type="checkbox"/> SLURRY <input type="checkbox"/> CHIPS <input type="checkbox"/> PELLETS <input type="checkbox"/> GRANULAR <input type="checkbox"/> CEMENT/SLURRY IF CEMENT/BENTONITE MIX: BAGS OF CEMENT USED _____ % OF BENTONITE USED _____ WATER USED/BAG _____ GAL.				MATERIAL <input type="checkbox"/> STEEL <input checked="" type="checkbox"/> THERMOPLASTIC (PVC) <input type="checkbox"/> OTHER		PROPOSED USE OF WELL <input type="checkbox"/> GAS MIGRATION WELL <input checked="" type="checkbox"/> OBSERVATION <input type="checkbox"/> EXTRACTION WELL <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PIEZOMETERS <input type="checkbox"/> INJECTION WELL <input type="checkbox"/> DIRECT PUSH	
SECONDARY FILTER PACK LENGTH _____ FT.				BENTONITE SEAL LENGTH <u>26</u> <input checked="" type="checkbox"/> CHIPS <input type="checkbox"/> PELLETS <input type="checkbox"/> GRANULAR <input type="checkbox"/> SLURRY <input type="checkbox"/> SATURATED ZONE <input type="checkbox"/> HYDRATED		DEPTH TO TOP OF PRIMARY FILTER PACK <u>30</u> FT.	
LENGTH OF PRIMARY FILTER PACK <u>15</u> FT.		SCREEN SCREEN DIAMETER <u>2</u> IN. SCREEN LENGTH <u>10</u> FT. DIAMETER OF DRILL HOLE <u>6</u> IN. DEPTH TO TOP <u>35</u> FT.		SCREEN MATERIAL <input type="checkbox"/> STEEL <input checked="" type="checkbox"/> THERMOPLASTIC (PVC) <input type="checkbox"/> OTHER		FORMATION DESCRIPTION	
						TOTAL DEPTH: <u>47.73</u>	

FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.

SIGNATURE (PRIMARY CONTRACTOR)		PERMIT NUMBER		DATE WELL DRILLING WAS COMPLETED 02/20/2012	
I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.					
SIGNATURE (WELL DRILLER) <i>Justin C M</i>		PERMIT NUMBER 004738-M		SIGNATURE (OF APPRENTICE)	
				APPRENTICE PERMIT NUMBER	



MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY		DATE RECEIVED
REFERENCE NO.		CHECK NO.
C.R. NO.		REVENUE NO.
STATE WELL NUMBER		
ENTERED	APPROVED BY	ROUTE
Ph1 Ph2 Ph3		

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levengood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW02		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION

TYPE	LENGTH AND DIAMETER OF SURFACE COMPLETION	DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED	SURFACE COMPLETION GROUT
<input checked="" type="checkbox"/> ABOVE GROUND	LENGTH <u>5</u> FT.	DIAMETER <u>6</u> IN.	<input checked="" type="checkbox"/> CONCRETE
<input type="checkbox"/> FLUSH MOUNT	DIAMETER <u>4</u> IN.	LENGTH <u>3</u> FT.	<input type="checkbox"/> OTHER _____

☒ LOCKING CAP ☐

☐ WEEP HOLE ☐

ELEVATION 731.872 FT.

ANNULAR SEAL

LENGTH _____ FT.

☐ SLURRY ☐ CHIPS

☐ PELLETS ☐ GRANULAR

☐ CEMENT/SLURRY

IF CEMENT/BENTONITE MIX:

BAGS OF CEMENT USED _____

% OF BENTONITE USED _____

WATER USED/BAG _____ GAL.

SECONDARY FILTER PACK

LENGTH _____ FT.

DEPTH TO TOP OF PRIMARY
FILTER PACK 15 FT.

LENGTH OF PRIMARY FILTER
PACK 15 FT.

SURFACE COMPLETION

☒ STEEL ☐ ALUMINUM ☐ PLASTIC

RISER

RISER PIPE DIAMETER 2 IN.

RISER PIPE LENGTH 23 FT.

DIAMETER OF DRILL HOLE 6 IN.

WEIGHT OR SDR# _____

MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER _____

BENTONITE SEAL

LENGTH 15

☒ CHIPS ☐ PELLETS ☐ GRANULAR

☐ SLURRY

☐ SATURATED ZONE ☐ HYDRATED

SCREEN

SCREEN DIAMETER 2 IN.

SCREEN LENGTH 10 FT.

DIAMETER OF DRILL HOLE 6 IN.

DEPTH TO TOP 20 FT.

SCREEN MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER _____

LOCATION OF WELL (D/M/S FORMAT ONLY)

LAT. _____ ° _____ ' _____ "

LONG. _____ ° _____ ' _____ "

SMALLEST _____ LARGEST _____

SECTION _____ TOWNSHIP _____ NORTH

RANGE _____ ☐ EAST ☐ WEST

MONITORING FOR: (CHECK ALL THAT APPLY)

☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY

☐ EXPLOSIVES ☐ METALS ☐ VOC

☐ SVOCs ☐ PESTICIDES/HERBICIDES

PROPOSED USE OF WELL

☐ GAS MIGRATION WELL ☒ OBSERVATION

☐ EXTRACTION WELL ☐ OPEN HOLE

☐ PIEZOMETERS ☐ INJECTION WELL

☐ DIRECT PUSH

DEPTH TO FORMATION DESCRIPTION

TO FROM

0 5 silt, slag gravel

5 9 silt, dark clay

9 16 silt, trace sand

16 27 silt and sand

27 30 sand, trace silt

TOTAL DEPTH: 32.75

FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.

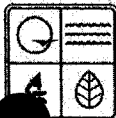
SIGNATURE (PRIMARY CONTACTOR)	PERMIT NUMBER	DATE WELL DRILLING WAS COMPLETED
		<u>02/21/2012</u>

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS. ☐ PUMP INSTALLED

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	SIGNATURE (OF APPRENTICE)	APPRENTICE PERMIT NUMBER
<i>Justin C. M...</i>	<u>004738-M</u>		

MO 780-1475 (07-11)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTACTOR PINK/OWNER
RETURN WHITE COPY WITH APPROPRIATE FEE TO: MISSOURI DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGY AND LAND SURVEY,
WELLHEAD PROTECTION SECTION, PO BOX 250, ROLLA, MO 65402 573-368-2165



MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY			DATE RECEIVED	
REFERENCE NO.			CHECK NO.	
C.R. NO.			STATE WELL NUMBER	
ENTERED Ph1 Ph2 Ph3			REVENUE NO.	
APPROVED BY			ROUTE	

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levengood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW03		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION		DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED		SURFACE COMPLETION GROUT		LOCATION OF WELL (D/W/S FORMAT ONLY)	
TYPE	LENGTH AND DIAMETER OF SURFACE COMPLETION					LAT. _____ ° _____ ' _____ "	
<input checked="" type="checkbox"/> ABOVE GROUND	LENGTH <u>5</u> FT.	DIAMETER <u>6</u> IN.		<input checked="" type="checkbox"/> CONCRETE		LONG. _____ ° _____ ' _____ "	
<input type="checkbox"/> FLUSH MOUNT	DIAMETER <u>4</u> IN.	LENGTH <u>3</u> FT.		<input type="checkbox"/> OTHER _____			
<input checked="" type="checkbox"/> LOCKING CAP				SURFACE COMPLETION		SMALLEST _____ LARGEST _____	
<input type="checkbox"/> WEEP HOLE				<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> ALUMINUM <input type="checkbox"/> PLASTIC		SECTION _____ TOWNSHIP _____ NORTH	
ELEVATION <u>729.88</u> FT.				RISER		RANGE _____ <input type="checkbox"/> EAST <input type="checkbox"/> WEST	
				RISER PIPE DIAMETER <u>2</u> IN.		MONITORING FOR: (CHECK ALL THAT APPLY)	
				RISER PIPE LENGTH <u>23</u> FT.		<input type="checkbox"/> RADIONUCLIDES <input type="checkbox"/> PETROLEUM PRODUCTS ONLY	
				DIAMETER OF DRILL HOLE <u>6</u> IN.		<input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> METALS <input type="checkbox"/> VOC	
				WEIGHT OR SDR# _____		<input type="checkbox"/> SVOCs <input type="checkbox"/> PESTICIDES/HERBICIDES	
				MATERIAL		PROPOSED USE OF WELL	
				<input type="checkbox"/> STEEL <input checked="" type="checkbox"/> THERMOPLASTIC (PVC)		<input type="checkbox"/> GAS MIGRATION WELL <input checked="" type="checkbox"/> OBSERVATION	
				<input type="checkbox"/> OTHER _____		<input type="checkbox"/> EXTRACTION WELL <input type="checkbox"/> OPEN HOLE	
						<input type="checkbox"/> PIEZOMETERS <input type="checkbox"/> INJECTION WELL	
						<input type="checkbox"/> DIRECT PUSH	
						DEPTH	
						TO FROM	
						0 5.5	
						5.5 12	
						12 27	
						27 30	
						FORMATION DESCRIPTION	
						silt, slag gravel	
						silt, dark clay	
						silt, some clay	
						sand, trace silt	
						TOTAL DEPTH: 32.72	

FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.

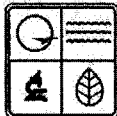
SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	DATE WELL DRILLING WAS COMPLETED
		02/21/2012

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS. ☐ PUMP INSTALLED

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	SIGNATURE (OF APPRENTICE)	APPRENTICE PERMIT NUMBER
<i>Justin C M</i>	604738-M		

MO 786-1415 (07-11)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
RETURN WHITE COPY WITH APPROPRIATE FEE TO: MISSOURI DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGY AND LAND SURVEY,
WELLHEAD PROTECTION SECTION, PO BOX 250, ROLLA, MO 65402 573-368-2165



MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY		DATE RECEIVED	
REFERENCE NO.		CHECK NO.	
C.R. NO.		REVENUE NO.	
STATE WELL NUMBER		APPROVED BY	
ENTERED Ph1 Ph2 Ph3		ROUTE	

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levensgood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW04		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION		DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED		SURFACE COMPLETION GROUT		LOCATION OF WELL (D/M/S FORMAT ONLY)	
TYPE	LENGTH AND DIAMETER OF SURFACE COMPLETION					LAT. _____ ° _____ ' _____ "	
<input checked="" type="checkbox"/> ABOVE GROUND	LENGTH <u>5</u> FT.	DIAMETER <u>6</u> IN.		<input checked="" type="checkbox"/> CONCRETE		LONG. _____ ° _____ ' _____ "	
<input type="checkbox"/> FLUSH MOUNT	DIAMETER <u>4</u> IN.	LENGTH <u>3</u> FT.		<input type="checkbox"/> OTHER _____			
<input checked="" type="checkbox"/> LOCKING CAP				SURFACE COMPLETION		SMALLEST _____ LARGEST _____	
<input type="checkbox"/> WEEP HOLE				<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> ALUMINUM <input type="checkbox"/> PLASTIC		SECTION _____ TOWNSHIP _____ NORTH	
ELEVATION <u>730.63</u> FT.				RISER		RANGE _____ <input type="checkbox"/> EAST <input type="checkbox"/> WEST	
				RISER PIPE DIAMETER <u>2</u> IN.		MONITORING FOR: (CHECK ALL THAT APPLY)	
				RISER PIPE LENGTH <u>23</u> FT.		<input type="checkbox"/> RADIONUCLIDES <input type="checkbox"/> PETROLEUM PRODUCTS ONLY	
				DIAMETER OF DRILL HOLE <u>6</u> IN.		<input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> METALS <input type="checkbox"/> VOC	
				WEIGHT OR SDR# _____		<input type="checkbox"/> SVOCs <input type="checkbox"/> PESTICIDES/HERBICIDES	
				MATERIAL		PROPOSED USE OF WELL	
				<input type="checkbox"/> STEEL <input checked="" type="checkbox"/> THERMOPLASTIC (PVC)		<input type="checkbox"/> GAS MIGRATION WELL <input checked="" type="checkbox"/> OBSERVATION	
				<input type="checkbox"/> OTHER _____		<input type="checkbox"/> EXTRACTION WELL <input type="checkbox"/> OPEN HOLE	
						<input type="checkbox"/> PIEZOMETERS <input type="checkbox"/> INJECTION WELL	
						<input type="checkbox"/> DIRECT PUSH	
ANNULAR SEAL				BENTONITE SEAL		DEPTH	
LENGTH _____ FT.				LENGTH <u>15</u>		TO FROM	
<input type="checkbox"/> SLURRY <input type="checkbox"/> CHIPS				<input checked="" type="checkbox"/> CHIPS <input type="checkbox"/> PELLETS <input type="checkbox"/> GRANULAR		0 3	
<input type="checkbox"/> PELLETS <input type="checkbox"/> GRANULAR				<input type="checkbox"/> SLURRY		3 5	
<input type="checkbox"/> CEMENT/SLURRY				<input type="checkbox"/> SATURATED ZONE <input type="checkbox"/> HYDRATED		5 10	
IF CEMENT/BENTONITE MIX:						10 16	
BAGS OF CEMENT USED _____						16 18.5	
% OF BENTONITE USED _____						18.5 30	
WATER USED/BAG _____ GAL.						FORMATION DESCRIPTION	
						silt, slag	
						silt, clay	
						no recovery	
						silt, dark clay	
						silt, sand	
						sand, trace silt	
SECONDARY FILTER PACK				SCREEN		TOTAL DEPTH:	
LENGTH _____ FT.				SCREEN DIAMETER <u>2</u> IN.		32.73	
				SCREEN LENGTH <u>10</u> FT.			
				DIAMETER OF DRILL HOLE <u>6</u> IN.			
				DEPTH TO TOP <u>20</u> FT.			
DEPTH TO TOP OF PRIMARY FILTER PACK <u>16</u> FT.				SCREEN MATERIAL			
				<input type="checkbox"/> STEEL <input checked="" type="checkbox"/> THERMOPLASTIC (PVC)			
				<input type="checkbox"/> OTHER _____			
LENGTH OF PRIMARY FILTER PACK <u>14</u> FT.							

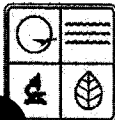
FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.

SIGNATURE (PRIMARY CONTRACTOR)		PERMIT NUMBER		DATE WELL DRILLING WAS COMPLETED	
				02/21/2012	
I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.				<input type="checkbox"/> PUMP INSTALLED	
SIGNATURE (WELL DRILLER)		PERMIT NUMBER		SIGNATURE (OF APPRENTICE)	
<i>Austin C M</i>		004738-M			
				APPRENTICE PERMIT NUMBER	

MO 780.115 (07-11)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTACTOR PINK/OWNER

RETURN WHITE COPY WITH APPROPRIATE FEE TO: MISSOURI DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGY AND LAND SURVEY, WELLHEAD PROTECTION SECTION, PO BOX 250, ROLLA, MO 65402 573-368-2165



MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY		DATE RECEIVED	
REFERENCE NO.		CHECK NO.	
C.R. NO.		REVENUE NO.	
STATE WELL NUMBER		REVENUE NO.	
ENTERED Ph1 Ph2 Ph3		APPROVED BY	ROUTE

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levensgood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW05		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION		DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED		SURFACE COMPLETION GROUT		LOCATION OF WELL (D/M/S FORMAT ONLY)	
TYPE	LENGTH AND DIAMETER OF SURFACE COMPLETION					LAT. _____ ° _____ ' _____ "	
<input checked="" type="checkbox"/> ABOVE GROUND	LENGTH <u>5</u> FT.	DIAMETER <u>6</u> IN.		<input checked="" type="checkbox"/> CONCRETE		LONG. _____ ° _____ ' _____ "	
<input type="checkbox"/> FLUSH MOUNT	DIAMETER <u>4</u> IN.	LENGTH <u>3</u> FT.		<input type="checkbox"/> OTHER _____			
<input checked="" type="checkbox"/> LOCKING CAP						SMALLEST _____ LARGEST _____	
<input type="checkbox"/> WEEP HOLE						SECTION _____ TOWNSHIP _____ NORTH	
						RANGE _____ <input type="checkbox"/> EAST <input type="checkbox"/> WEST	
ELEVATION <u>729.05</u> FT.						MONITORING FOR: (CHECK ALL THAT APPLY)	
						<input type="checkbox"/> RADIONUCLIDES <input type="checkbox"/> PETROLEUM PRODUCTS ONLY	
						<input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> METALS <input type="checkbox"/> VOC	
						<input type="checkbox"/> SVOCs <input type="checkbox"/> PESTICIDES/HERBICIDES	
						PROPOSED USE OF WELL	
						<input type="checkbox"/> GAS MIGRATION WELL <input checked="" type="checkbox"/> OBSERVATION	
						<input type="checkbox"/> EXTRACTION WELL <input type="checkbox"/> OPEN HOLE	
						<input type="checkbox"/> PIEZOMETERS <input type="checkbox"/> INJECTION WELL	
						<input type="checkbox"/> DIRECT PUSH	
						DEPTH	
						TO FROM	
						FORMATION DESCRIPTION	
						0 3.5 silt, slag gravel	
						3.5 11.5 silt, trace clay	
						11.5 16 sand, trace clay	
						16 19 silt, dark clay	
						19 24 silt, trace sand	
						24 26.5 sand, trace silt	
						26.5 30 silt, some sand	
						TOTAL DEPTH: 32.70	

ANNULAR SEAL

LENGTH _____ FT.

☐ SLURRY ☐ CHIPS

☐ PELLETS ☐ GRANULAR

☐ CEMENT/SLURRY

IF CEMENT/BENTONITE MIX:

BAGS OF CEMENT USED _____

% OF BENTONITE USED _____

WATER USED/BAG _____ GAL.

RISER

RISER PIPE DIAMETER 2 IN.

RISER PIPE LENGTH 23 FT.

DIAMETER OF DRILL HOLE 6 IN.

WEIGHT OR SDR# _____

MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER _____

BENTONITE SEAL

LENGTH 15

☒ CHIPS ☐ PELLETS ☐ GRANULAR

☐ SLURRY

☐ SATURATED ZONE ☐ HYDRATED

SCREEN

SCREEN DIAMETER 2 IN.

SCREEN LENGTH 10 FT.

DIAMETER OF DRILL HOLE 6 IN.

DEPTH TO TOP 20 FT.

SCREEN MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER _____

SECONDARY FILTER PACK

LENGTH _____ FT.

DEPTH TO TOP OF PRIMARY FILTER PACK 16 FT.

LENGTH OF PRIMARY FILTER PACK 14 FT.

FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.		
SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	DATE WELL DRILLING WAS COMPLETED
		02/22/2012
HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.		<input type="checkbox"/> PUMP INSTALLED
SIGNATURE (WELL DRILLER)	PERMIT NUMBER	SIGNATURE (OF APPRENTICE)
<i>Justin C. M...</i>	004738-M	
		APPRENTICE PERMIT NUMBER

MO 780-1475 (07-11)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
RETURN WHITE COPY WITH APPROPRIATE FEE TO: MISSOURI DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGY AND LAND SURVEY,
WELLHEAD PROTECTION SECTION, PO BOX 250, ROLLA, MO 65402 573-388-2165



MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM
**MONITORING WELL
CERTIFICATION RECORD**

OFFICE USE ONLY		DATE RECEIVED	
REFERENCE NO.		CHECK NO.	
C.R. NO.			
STATE WELL NUMBER		REVENUE NO.	
ENTERED		APPROVED BY	ROUTE
Ph1	Ph2	Ph3	

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

NOTE: THIS FORM IS NOT TO BE USED FOR NESTED WELLS

OWNER NAME AK Steel		CONTACT NAME Cory Levengood/Wendy Coates		VARIANCE GRANTED BY DNR	
OWNER ADDRESS 5050 Section Avenue		CITY Cincinnati	STATE OH	ZIP CODE 45212	NUMBER
SITE NAME Field			WELL NUMBER 2MW06		COUNTY Jackson
SITE ADDRESS 7000 Winner Road			CITY Kansas City, MO		STATIC WATER LEVEL

SURFACE COMPLETION

TYPE	LENGTH AND DIAMETER OF SURFACE COMPLETION	DIAMETER AND DEPTH OF THE HOLE SURFACE COMPLETION WAS PLACED	SURFACE COMPLETION GROUT
<input checked="" type="checkbox"/> ABOVE GROUND	LENGTH <u>5</u> FT.	DIAMETER <u>6</u> IN.	<input checked="" type="checkbox"/> CONCRETE
<input type="checkbox"/> FLUSH MOUNT	DIAMETER <u>4</u> IN.	LENGTH <u>3</u> FT.	<input type="checkbox"/> OTHER

☒ LOCKING CAP

☐ WEEP HOLE

ELEVATION 730.67 FT.

ANNULAR SEAL

LENGTH _____ FT.

☐ SLURRY ☐ CHIPS

☐ PELLETS ☐ GRANULAR

☐ CEMENT/SLURRY

IF CEMENT/BENTONITE MIX:

BAGS OF CEMENT USED _____

% OF BENTONITE USED _____

WATER USED/BAG _____ GAL.

SECONDARY FILTER PACK

LENGTH _____ FT.

DEPTH TO TOP OF PRIMARY

FILTER PACK 16 FT.

LENGTH OF PRIMARY FILTER

PACK 14 FT.

SURFACE COMPLETION

☒ STEEL ☐ ALUMINUM ☐ PLASTIC

RISER

RISER PIPE DIAMETER 2 IN.

RISER PIPE LENGTH 23 FT.

DIAMETER OF DRILL HOLE 6 IN.

WEIGHT OR SDR# _____

MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER

BENTONITE SEAL

LENGTH 15

☒ CHIPS ☐ PELLETS ☐ GRANULAR

☐ SLURRY

☐ SATURATED ZONE ☐ HYDRATED

SCREEN

SCREEN DIAMETER 2 IN.

SCREEN LENGTH 10 FT.

DIAMETER OF DRILL HOLE 6 IN.

DEPTH TO TOP 20 FT.

SCREEN MATERIAL

☐ STEEL ☒ THERMOPLASTIC (PVC)

☐ OTHER

LOCATION OF WELL (DMS FORMAT ONLY)

LAT. _____ ° _____ ' _____ "

LONG. _____ ° _____ ' _____ "

SMALLEST _____ LARGEST _____

SECTION _____ TOWNSHIP _____ NORTH

RANGE _____ ☐ EAST ☐ WEST

MONITORING FOR: (CHECK ALL THAT APPLY)

☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY

☐ EXPLOSIVES ☐ METALS ☐ VOC

☐ SVOCs ☐ PESTICIDES/HERBICIDES

PROPOSED USE OF WELL

☐ GAS MIGRATION WELL ☒ OBSERVATION

☐ EXTRACTION WELL ☐ OPEN HOLE

☐ PIEZOMETERS ☐ INJECTION WELL

☐ DIRECT PUSH

DEPTH		FORMATION DESCRIPTION
TO	FROM	
0	3.5	silt, slag gravel
3.5	17.5	silt, dark clay
17.5	22	silt, dark clay
22	30	silt, trace sand
TOTAL DEPTH:		32.97

FOR CASED WELLS, SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE & SIZE OF ALL CASING, HOLE DIAMETER & GROUT USED.

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	DATE WELL DRILLING WAS COMPLETED
		02/22/2012

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH MISSOURI DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

☐ PUMP INSTALLED

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	SIGNATURE (OF APPRENTICE)	APPRENTICE PERMIT NUMBER
<i>[Signature]</i>	004738-M		

MO 780-1415 (07-11)

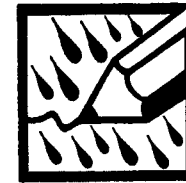
DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER

RETURN WHITE COPY WITH APPROPRIATE FEE TO: MISSOURI DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGY AND LAND SURVEY, WELLHEAD PROTECTION SECTION, PO BOX 250, ROLLA, MO 65402 573-368-2165

Appendix D
Field Logbook

AK Steel

66252



"Rite in the Rain."

ALL-WEATHER

JOURNAL

No. 390NF

Burns & McDonnell

2/20/12

AK Steel

J. Collier

Date - Monday, February 20, 2012

Task - Install wells in SWMU 2 Area Landfill

Weather - Overcast 40's-50's Afternoon rain

Personnel - Justin Carter, Russ Gordon, Chris Harrison
Justin Miller, Adam Maier

Equipment - Geoprobe B140 DT

0745 meet WDC @ Flying J

0755 Arrive onsite, perform site walk through w/
drill crew & locate drilling locations. Drill rig
not on site due to flat tires on trailer when
mobilizing to site.

0830 WDC offsite to meet RSC to pick up Bobcat

0845 RSC & WDC onsite, off load Bobcat

0900 RSC offsite

0910 WDC offsite to pick up supplies to build the
decon pad

1000 WDC returns to site, & begin building decon pad

1045 WDC offsite to meet EMI well supply

1128 EMI & WDC offsite. WDC to meet driver
of drill rig at Flying J

1148 WDC onsite w/ drill rig

1150 Begin unloading drill rig & set up at 2MW01

1152 Calibrate PID Mini Rae 2000 & LEL RKI GX-2003

PID w/ 100 ppm isobutylene > 100 ppm

LEL w/ 50% LEL & 20.9% O₂ > 60% & 20.9%1220 offsite to 404 Building w/ WDC to get H₂O

3/20/12

AK Steel

J. Collier

1235 Arrive at 404 Building & begin filling H₂O tanks

1315 Leave 404 Building

1350 Arrive back onsite

1355 Safety meeting

1425 Begin drilling

1545 Call Sharon Shetter to discuss 2MW01. Ask about
Historical H₂O table & where to set well1600 Sharon S called back, will set well in at
45'. Borehole TD-50' hgs

1615 Backfill boring from 50'-46' w/ bentonite chips

1618 Backfill boring from 46'-45' w/ sand

1625 Set Well

End Cap - 0.21 Screen - 10.00

Riser - 10.00, 10.00, 10.00, 5.00, 2.52

1632 Add Filter pack sand Filter Sil (Unimin corporation)
20/40 grade. 5 total bags of sand. 250 lbs. to
32' hgs1644 Add Bentonite chips Enviroplug 3/8" medium chip
(Wyo-Ben, Inc) 4 total bags of Bentonite chips
to 2' hgs

1712 Load rig & equipment

1730 offsite

T. Collier
2/20/12

2/22/12

At Steel

J. Carver

Date - Tuesday, February 21, 2012

Task - Install wells in SWMU 2 Area Landfill

Weather - Partly cloudy 50's slight breeze

Personnel - Justin Carver, Russ Gordon, Chris Harrison

Justin Miller, Adam Maier

Equipment - Geoprobe 8140DT

0730 Arrive onsite

0738 Safety meeting

0750 Decon equipment

0753 Calibrate PID Mini Rae 2000 & LEL RKI GX-2003

PID w/100 ppm isobutylene @ 100 ppm

LEL w/50% LEL & 20.9% O₂ @ 50% & 20.9%

0810 Mobilize to 2MW02

0820 Set up drill rig

0844 Begin drilling

1000 Finish drilling

1504 Set Well

End Cap - 0.18' Screen - 10.00

Riser - 9.99, 10.00, 2.58

1006 Add Filler Pack Sand FilterSil (Unimin Corp)

20/40 grade, 5 total bags of sand 250 lbs to 15.5' bgs

1027 Add Bentonite Chips Enviroplug 3/8" medium Chip (Wyo-Ben, Inc) 3 total bags of Bentonite Chips to 2' bgs

1052 Decon equipment

2/22/12

At Steel

J. Carver

1118 Mobilize to 2MW04

1124 Set up drill rig

1133 Begin drilling

1232 Finish drilling

1245 Offsite to 404 Building to get more H₂O
& lunch1410 Arrive at 404 Building to get H₂O

1437 Leave 404 Building

1517 Arrive onsite

1523 Set well

End Cap - 0.18' Screen - 10.00

Riser - 10.01, 10.00, 2.54

1525 Add Filler Pack Sand FilterSil (Unimin Corp)
20/40 grade, 4 1/2 total bags of sand 225 lbs
to 16' bgs1605 Add Bentonite Chips Enviroplug 3/8" medium
Chip (Wyo-Ben, Inc) 3 total bags of Bentonite
Chips to 2' bgs

1628 Move equipment off of hole

1640 Decon equipment

1708 Mobilize to 2MW06

1720 Set up at 2MW06

1745 Offsite

J. Carver
2/21/12

J. Carter

AR sheet 1

2/22/12

Date - Wednesday, February 22, 2012

Task - Install wells in SWNV-2 Area landfill

Weather - Clear, sunny 60's

Personnel - Justin Carter, Russ Gordon, Chris Harrison

Justin Miller

Equipment - Geoprobe 8140DT

0700 Arrive onsite

0705 Calibrate Wt PID Mini; Rate 2000 & LEL RFI OX200

PID w/100 ppm isobutylair @ 100.1 ppm

LEL w/50% LEL + 20.9% O2 @ 50% & 20.9%

0712 Start rig to let warm up

0725 Safety meeting

0732 Begin drilling @ 2mw06

0803 Finish drilling

0805 Set well

End Cap - 0.18 Screen - 9.99

Riser - 10.00, 9.99, 2.81

0808 Add Filter Pack Sand Filler S-1 (Unimin Corp)

20/40 grade. 4 total bags of sand 200lbs to

16' bags

0827 Add Bentonite Chips Enveloping 3/8" medium chip

(Luyo-Ben, Inc) 3 total bags of bentonite

chips to 2' bags

0840 Move equipment off of hole

0900 Decon equipment

0923 Mobilize to 2mw03

J. Carter

AR sheet

2/22/12

0935 Set up at 2mw03

0942 Begin drilling

1012 Finish drilling

1028 Set well

End Cap - 0.18 Screen - 10.00

Riser - 10.00, 10.00, 2.54

1030 Add Filter Pack Sand Filler S-1 (Unimin Corp)

20/40 grade. 4 total bags of sand 200 lbs

to 16' bags

1035 Sharon Skilton + Bruce Morrison (LEPA) onsite

1057 Add Bentonite Chips Enveloping 3/8" medium

chip (Luyo-Ben, Inc) 3 total bags of bentonite

chips to 2' bags

1128 Sharon Skilton + Bruce Morrison onsite, move

off of hole

1140 Decon equipment

1210 Offsite for lunch

1244 Arrive back onsite

1300 Mobilize to 2mw05

1336 Set up at 2mw05

1346 Begin drilling

1423 Finish drilling

1428 Set well

End Cap - 0.18 Screen - 10.01

Riser - 10.01, 10.00, 2.51

2/22/12

J. Carter

3/22/12 AK: Steel J. Carher

1430 Add Filter Pack Sand Filter S.I (Unimin Corp)

20/40 grade. 4 total bags of sand 200 lbs to 15' bgs

1442 Add Bentonite Chips Enviroplus 3/8" medium chip (Wyo-Ben, Inc) 3 total bags of bentonite chips to 2' bgs

1500 Begin to drill out bumper post holes w/ rig at 2mw01, 2mw02, 2mw03, 2mw04, 2mw05, & 2mw06

1520 Decon equipment

1600 Gather soil EDW drums (4) & drilling H₂O drum (1)

1645 Finish drilling out bumper post holes

1700 Begin digging well pads

1730 offsite

2/22/12

J. Carher

3/23/12 AK: Steel J. Carher

Date - Thursday, February 23, 2012

Task - Well Completions & Development

Weather - clear sunny 40's - 50's

Personnel - Justin Carher, Russ Gordon, Chris Harrison
Justin Miller

Equipment - 12 volt pump

0715 Arrive onsite

0718 Calibrate YSI-556 MPS

pH 4.00/7.00/10.00 - 4.00/7.01/10.02

Cond 2.000 ms - 1.996 ms

Calibrate Turbidity meter Hach 2100P

5.44/48.2/549 - 6.01/53.1/557

0745 WDC onsite

0800 Set up at 2mw01 to develop

WL - 32.70 TD - 47.18

0808 Begin development w/ bailer

Time	Vol	Temp	Cond	pH	Turb	Misc
0810	I	16.21	1.110	6.84	71000	Dark Gray
0823	5	17.12	1.224	6.88	71000	Dark Gray
0836	10	17.24	1.245	6.93	71000	Dark Gray

0838 Begin pumping well w/ 12 volt pump

0840 Well pumped dry TD - 47.18

Well depth ~ 1/2 foot shallower than installed depth

0850 Call Sharon Shelton to discuss well development

/ 2/23/12
J. Carher

2/23/12

AK Steel

J. Carher

0835 Sharon Shelton, Walter MacKenzie, & Martha Hildebrandt called me to discuss approach to development. Will use bailer to surge screen & attempt to remove as much silt/sand from bottom of well & then use 12 volt pump after air lift.

0930 2mw02 WL-22.85 TD-32.75 no silt/sand in well

0938 2mw04 WL-21.44 TD-31.88 ~ 1' of silt/sand in well

0946 2mw06 WL-15.46 TD-32.30 ~ 1/2' of silt/sand in well

0958 2mw03 WL-14.68 TD-31.62 ~ 1' of silt/sand in well

1010 2mw05 WL-13.71 TD-32.70 no silt/sand in well

* Installed Depths of wells *

2mw01 47.73'

2mw02 32.75'

2mw03 32.72'

2mw04 32.73'

2mw05 32.70'

2mw06 32.97'

2/23/12

J. Carher

2/23/12

AK Steel

J. Carher

1046 Set up at 2mw06 & begin development w/bailer

Time	Vol	Temp	Cond	pH	Turb	Misc
1050	1	17.81	0.620	6.87	71000	dark gray
1108	5	18.57	0.681	6.88	71000	dark gray
1130	10	18.83	0.678	6.90	71000	dark gray
1133	TD-32.50					
1200	Lunch					

1300 Return from lunch

1303 Set up at 2mw04 & begin development w/bailer

Time	Vol	Temp	Cond	pH	Turb	Misc
1317	1	15.63	0.690	6.84	71000	dark gray
1336	5	15.11	0.712	6.77	71000	dark gray
1402	10	15.09	0.713	6.78	71000	dark gray
1405	TD-32.00'					

1409 Set up at 2mw02 & begin development w/bailer

Time	Vol	Temp	Cond	pH	Turb	Misc
1418	1	15.92	1.110	7.07	71000	dark gray
1430	5	16.22	0.840	7.10	71000	dark gray
1451	10	16.28	0.846	7.12	71000	dark gray
1453	TD-32.75'					

1520 Set up at 2mw03 & begin development w/bailer

Time	Vol	Temp	Cond	pH	Turb	Misc
1528	1	16.33	0.902	6.91	71000	dark gray
1539	5	16.01	0.621	6.98	71000	dark gray
1550	10	16.02	0.630	6.87	71000	dark gray
1553	TD-32.47					

2/23/12

J. Carher

2/23/12 AK Steel J. Carher
 1558 Set up at 2mw05 & begin development w/boiler

Time	Val	Temp	Cond	pH	Turb	Misc
1602	I	15.77	1.000	6.28	71000	dark gray
1629	S	16.03	1.008	6.38	71000	dark gray
1635	10	16.21	1.002	6.44	71000	dark gray
1638	TD - 32.70					

2/23/12
 J. Carher

2/23/12 AK Steel J. Carher
 Date - Friday, February 24, 2012
 Task - Well Development
 Weather - Clear, sunny 50 - 60
 Personnel - Justin Carher
 Equipment - air lift, compressor, generator, 12volt pump
 1100 Arrive onsite
 1103 Calibrate VSI 556-MPS
 pH 4.00/7.00/10.00 - 4.00/7.02/10.06
 cond 2.000 ms - 1.994 ms
 Calibrate Turbidity meter Hach 2100P
 5.44/48.2/549 - 5.88/51.7/553
 1123 Set up at 2mw01 & construct air lift device
 to remove silt/sand from bottom of well
 TD - 47.18
 1200 Use air to disturb silt/sand from bottom of
 well
 1212 Use 12 volt pump to remove water
 1222 Pumped dry TD - 47.70
 1233 Arrive at 2mw04 & set up air lift device
 TD - 32.00'
 1245 Use air lift device to disturb silt/sand
 from bottom of well
 1250 Use 12 volt pump to remove water
 1300 Stop pumping water TD - 32.73
 1305 Arrive at 2mw06 & set up air lift device
 TD - 32.40

1. 14

2/ 3/24/12

AK Steel

J. Carher

151 1315 Use air lift device to disturb silt/sand from
 bottom of well

1 1320 Use 12 volt pump to remove water

11 1324 Pumped dry TD-32.97

16 1405 Arrive at 2mw03 & set up air lift device

16 TD-32.49 & use air lift to disturb silt/sand

1420 Use 12 volt pump to remove water

1423 Pumped dry TD-32.72

1452 Arrive at 2mw05 & set up air lift device

TD-32.70

1502 Use air lift pump to disturb silt/sand

1510 Use 12 volt pump to remove water

1520 Stop pumping water TD-32.70

1528 Arrive at 2mw02 & set up air lift device

TD-32.75

1535 Use air lift device to disturb silt/sand

1542 Use 12 volt pump to remove water

1552 Stop pumping water TD-32.75

1600 Clean up equipment

1645 Offsite to return rental generator & air
 compressor

2/24/2012

J. Carher

15

3/27/12

AK Steel

J. Carher

Date - Monday, February 27, 2012

Task - Well Development

Weather - Clear, sunny 40-50's

Personnel - Justin Carher

Equipment - 12 volt pump

0800 Leave KA office

0800 Arrive onsite

0910 Calibrate YSI-556MPS

pH 4.00/7.00/10.00 \approx 4.01/7.02/9.98

Cond 2000ms \approx 1.996 ms

Calibrate Turbidity meter Hach 2100P

5.44/48.8/549 \approx 6.24/52.1/543

0940 Set up at 2mw01 to develop w/12 volt pump

0950 WL-34.51 TD-47.70

0953 Begin developing well

Time	Vol	pH	Cond	Temp	Turb	Misc
0958	1	7.21	1.881	14.97	21000	dark gray
1003	5	7.30	1.889	15.21	21000	dark gray
1008	10	7.26	1.908	15.43	21000	dark gray
1013	15	7.22	1.918	15.48	21000	dark gray
1015	18					

Well pumped dry \approx 17 gallons, will
 let recharge to 90%

1018 Decon pump

1030 Set up at 2mw02 to develop w/12 volt pump

1033 WL-23.14 TD-32.75

1036 Begin developing well

2/27/12

AK Steel

J. Carver

Time	Vol	pH	Cond	Temp	Turb	Misc
1037	I	10.70	1.001	15.10	21000	dark gray
1042	S	7.21	0.581	15.47	321	lt gray
1047	10	7.12	0.577	15.58	101	cloudy
1052	15	7.08	0.575	15.50	71.5	clear
1057	20	7.07	0.573	15.56	52.1	clear
1102	25	7.06	0.572	15.49	15.8	clear
1107	30	7.07	0.572	15.51	7.49	clear
1112	35	7.07	0.570	15.58	5.38	clear
1116	40	WL-23.28	TD-32.75			

1118 Decon pump

1127 Set up at 2mW04 to develop 1/2 volt pump

1128 WL-21.50 TD-32.73

1130 Begin developing well

Time	Vol	pH	Cond	Temp	Turb	Misc
1132	I	7.12	1.239	14.80	21000	dark gray
1137	S	7.00	1.120	14.87	201	cloudy
1142	10	6.77	1.117	14.91	79.9	clear
1147	15	6.71	1.110	14.91	9.83	clear
1152	20	6.70	1.107	14.96	4.70	clear
1157	25	6.66	1.102	14.98	5.83	clear
1202	30	6.63	1.100	14.95	4.56	clear
1205	WL-21.75	TD-32.75				

1212 Decon pump

1220 Set up at 2mW06 to develop 1/2 volt pump

1222 WL-16.32 TD-32.96

2/27/12

AK Steel

J. Carver

1243	Begin developing					
Time	Vol	pH	Cond	Temp	Turb	Misc
1245	I	7.03	1.083	14.24	21000	dark gray
1250	S	6.87	1.018	15.31	21000	dark gray
1255	10	6.89	1.000	15.58	21000	
1257	Pumped dry @ 12 gallons will let recharge to 90%					
1300	Decon pump					
1313	Set up at 2mW03 to develop 1/2 volt pump					
1315	WL-20.58	TD-32.71				

1316 Begin developing well

Time	Vol	pH	Cond	Temp	Turb	Misc
1317	I	6.92	0.711	15.15	21000	dark gray
1322	S	6.83	0.700	15.00	21000	dark gray
1325	8	6.71	0.692	15.02	21000	dark gray

Pumped dry @ 9 gallons will let recharge to 90%

1330 Decon pump

1343 Set up at 2mW05 to develop 1/2 volt pump

1347 WL-17.18 TD-32.70

1350 Begin developing

Time	Vol	pH	Cond	Temp	Turb	Misc
1331	I	7.75	0.976	14.39	21000	dark gray
1336	S	7.12	0.956	14.39	455	gray
1341	10	7.12	0.906	14.53	202	cloudy
1346	15	7.18	0.869	14.54	376	cloudy

2/27/12

AK Steel

J. Colner

2mw05 Well Development (Continued)

Time	Vol	pH	Cond	Temp	Turb	Misc
1351	20	7.20	0.831	14.58	421	gray
1356	25	7.23	0.799	14.55	220	cloudy
1401	30	7.25	0.781	14.52	588	gray
1406	35	7.20	0.793	14.66	207	cloudy
1411	40	7.24	0.745	14.58	95.6	clear
1416	45	7.23	0.784	14.62	212	cloudy
1421	50	7.22	0.753	14.64	354	cloudy
1426	55	7.24	0.760	14.57	221	cloudy
1431	60	7.22	0.738	14.60	101	clear
1436	65	7.18	0.755	14.65	49.0	clear
1441	70	7.16	0.750	14.65	40.9	clear

1444 WL-30.70 TD-32.70

1447 Decon pump

1520 Arrive back at 2mw01 WL-34.67

1524 Continued development

Time	Vol	pH	Cond	Temp	Turb	Misc
1525	17	7.28	1.917	15.35	21000	dark gray
1530	22	7.16	1.901	15.87	21000	dark gray
1535	27	7.12	1.898	16.02	21000	dark gray
1540	32	7.08	1.890	15.72	21000	dark gray

1543 Pumped dry @ 35 gallons will let well recharge to 90%

1550 Decon pump

2/27/12
J. Colner

2/27/12

AK Steel

J. Colner

1608 Call Sharon Shelton to discuss development of 2mw01, 2mw03, + 2mw05. Will develop dry 3 times as per work plan

1612 Arrive back at 2mw06 WL-16.50

1615 Begin developing

Time	Vol	pH	Cond	Temp	Turb	Misc
1616	12	6.77	0.988	14.96	71000	dark gray
1621	14.5	6.70	0.990	14.97	319	cloudy
1626	17	6.66	0.992	14.96	428	gray
1631	19.5	6.60	0.991	14.96	490	gray
1636	22	6.63	0.992	14.94	620	gray
1641	24.5	6.59	0.988	14.92	827	dark gray

1643 Pumped dry @ 25 gallons

1647 Decon pump

1654 Arrive back at 2mw01 + set 12 volt pump in well to begin development tomorrow

1710 offsite

2/27/12
J. Colner

20

J. Collier
J. Kolb

2/28/12 Ark Steel

1 Date - Tuesday, February 28, 2012

Task - Well Development + Low-Flow sampling

Weather - Overcast, rain 40's - 50's

Personnel - J. Collier + Jay Kolb

Equipment - 12 volt pump, low-flow bladder pump

0630 Arrive onsite

0638 Calibrate YSI-556 mps

pH 4.00/7.00/10.00 > 3.99/7.00/9.99

Cond 2.000 ms > 2.000 ms

ORP 220 mv > 224.5 mv

DO in air > 101.4%

Calibrate Turbidity meter Hach 2100P

5.44/48.2/549 > 6.22/57.4/524

0650 Arrive at 2mw01 to continue development

0652 Begin development WL-34.50

Time	Vol	pH	Cond	Temp	Turb	Misc
0653	35	7.12	1.792	14.25	400	cloudy
0658	40	7.08	1.790	14.27	297	cloudy
0703	45	7.07	1.780	14.35	108	clear
0708	50	7.05	1.777	14.48	77.7	clear
0710	52	7.03	1.776	14.55	388	cloudy

Pumped dry @ 52 gallons. 2mw01 has
been developed dry 3 times TD-47.70

0720 Decon pump

0735 Set up at 2mw06 to continue development
WL-16.17.

J. Collier
J. Kolb 21

2/28/12 Ark Steel

0745 Begin development

Time	Vol	pH	Cond	Temp	Turb	Misc
0746	24.5	7.18	1.201	13.97	71000	dark gray
0751	29.5	7.12	1.100	14.78	452	gray
0756	34.5	7.08	0.997	14.84	283	cloudy
0758	Pumped dry @ 36 gallons. 2mw06 has been developed dry 3 times TD-32.97					

0806 Decon pump, Jay Kolb onsite

0820 Surveyors called, will go meet them at
Flying J

0850 Arrive back onsite

0853 Drive surveyors around site + show
them where the new wells are at

0908 Set up at 2mw03 WL-20.43

0914 Begin developing

Time	Vol	pH	Cond	Temp	Turb	Misc
0915	8	7.47	0.613	14.37	819	dark gray
0920	13	7.40	0.620	14.97	962	dark gray
0922	15	7.30	0.628	15.03	71000	dark gray

Pumped dry @ 15 gallons. Leave 12 volt
pump in well until 90% recharge to
finish developing

0927 Offsite to get CO₂ @ Linwood + get
Ice @ gas station

1000 Arrive back onsite

2/28/12
J. Collier

2/28/12

AK steel

J. Kolb

1005 Set up at 2mw02 to low-flow purge & sample

1008 Decon bladder pump & install new bladder

1025 Offsite to Linwood to get vice grips to fix bladder pump

1035 Return to site

1114 Begin low-flow purging 2 2mw02 see Field Groundwater Sampling Form for details

1225 Collect 2mw02/cw01, 2mw02/cw01MS, 2mw02/cw01MSN for VOC, Total Lead, Total Cadmium, Dissolved Lead, Dissolved Cadmium, & Dissolved Hexavalent Chromium

1300 Decon bladder pump

1316 Set up at 2mw01 to low-flow purge & sample

1324 Begin low-flow purging see Field Groundwater Sampling Form for details

1415 Collect 2mw01/cw01 for VOC, Total Lead, Total Cadmium, Dissolved Lead, Dissolved Cadmium, Dissolved Hexavalent Chromium

1424 Decon bladder pump

1435 Collect 2mw01/cw01ERB for VOC, Total Lead, Total Cadmium, Dissolved Lead, Dissolved Cadmium, Dissolved Hexavalent Chromium

2/28/12

AK steel

* Rinsate Sample, Kistler HPLC H₂O Lot 108387

1450 Backpack controller shorted out due to the rain when collecting rinsate. Called Sharon Shelton to inform her

1457 Call Field Environmental to have a new backpack controller delivered to site

1518 Set up at 2mw04. leave tubing & pump in well

1530 Offsite to Flying J to pick up backpack controller from Field Environmental

1600 Arrive back onsite

1604 Set up at 2mw03 to continue development
WL - 20.59

1606 Begin developing

Time	Vol	pH	Cond	Temp	Turb	Misc
1607	15	7.37	0.612	14.72	587	cloudy
1612	20	7.28	0.618	14.80	484	cloudy
1617	23	7.22	0.618	14.88	121	clear

Pumped dry = 23 gallons, 2mw03 has been developed dry 3 times TD - 32.71

1620 Decon 12 volt pump

1630 Pack cooler

1657 Arrive at gas station to get more ice for cooler

1722 Arrive at FedEx & drop off 1 cooler for Priority Overnight Delivery Tracking # 99869324937

24

J. Carhu

2/29/12

AK Steel

J. Kolb

Date - Wednesday, February 29, 2012

Task - Low-flow sampling

Weather - clear, sunny windy 30's 30-40 mph S-SW

Personnel - Justin Carhu & Jay Kolb

Equipment - low-flow bladder pump

0724 Arrive onsite

0727 Open soil IDW drums (4)

0745 Collect Soil IDW Drum Composite for
Total RCRA Metals & TCLP RCRA Metals

0800 Collect Soil IDW Drum 1 for VOC & TCLP VOC

0810 Collect Soil IDW Drum 2 for VOC & TCLP VOC

0820 Collect Soil IDW Drum 3 for VOC & TCLP VOC

0830 Collect Soil IDW Drum 4 for VOC & TCLP VOC

0845 Get more ice for coolers

0903 Arrive at AK Steel main facility to
locate SWMU 13, 17 & 33 boundaries1001 Finish locating boundaries of SWMU
13, 17, & 33

1004 Offsite to SWMU-2 Area Landfill

1020 Arrive at SWMU-2 Area landfill

1023 Calibrate YSI-556 MPS

pH 4.00/7.00/10.00 \Rightarrow 4.00/6.99/10.01Cond 2.000 ms \Rightarrow 2.000 msORP 220 mV \Rightarrow 220.1 mV

DO in air 101.4%

2/29/12

J. Carhu

J. Carhu²⁵

J. Kolb

2/29/12

AK Steel

Calibrate Turbidity meter Hach 2100P

5.44/48.2/549 \Rightarrow 6.42/53.6/5461050 Set up at 2mw04 to low-flow purge &
sample1103 Begin low-flow purging \Rightarrow 2mw02 see
Field Groundwater Sampling Form for details1140 Collect 2mw04/GW01 & 2mw04/GW01A (DRP)
for VOC, Total Lead, Total Cadmium, Dissolved
Lead, Dissolved Cadmium, Dissolved Hexavalent
Chromium

1200 Decon bladder pump

1220 Set up at 2mw05 to low-flow purge & sample

1310 ~~Set up~~ ^{Collect} at 2mw05/GW01 for VOC, Total Lead,
Total Cadmium, Dissolved Lead, Dissolved
Cadmium, Dissolved Hexavalent Chromium

1330 Decon bladder pump

1342 Jay Kolb offsite

1347 Set up at 2mw03 to low-flow purge &
sample1358 Begin low-flow purging \Rightarrow 2mw03 see
Field Groundwater Sampling Form for
details1435 Collect 2mw03/GW01 for VOC, Total Lead,
Total Cadmium, Dissolved Lead, Dissolved
Cadmium, Dissolved Hexavalent Chromium

2/29/12

J. Carhu

2/29/12

AK Steel

1454 Decon bladder pump

1510 offsite for lunch

1530 Return from lunch

1535 Call Sharon Shelton to discuss water IDW

1543 Set up at 2mw06 to low-flow purge & sample

1600 Begin low-flow purging 2 2mw06 see

Field Groundwater Sampling Form for details

1805 Collect 2mw06 / 0w01 for VOC, Total Lead,

Total Cadmium, Dissolved Lead, Dissolved
Cadmium, Dissolved Hexavalent Chromium

1817 Decon bladder pump

1835 Offsite to gas station to get more ice
& pack coolers1855 Arrive at gas station get ice & pack
coolers1930 Arrive at FedEx & drop off 2 coolers
for Priority Overnight Delivery. Tracking #
89 86-9324-9354

2/29/12

J. Collier

3/1/12

AK Steel

Date - Thursday, March 1, 2012

Task - Liquid IDW management

Weather - Clear sunny 60's - 70's

Personnel - Justin Collier & Jay Kolb

Equipment - Polytank, trash pump, GAC unit

0730 Arrive at KC office pick up Jay Kolb

0750 Arrive at 404 Building & pick up trailer & 375
gallon poly tank0810 Arrive back at KC office to pick up the
portable GAC unit & trash pump. Trash pump
is not with GAC unit. Will ask around the
office if anyone knows where it is.0840 Leave KC office, could not find trash pump
will stop by home depot to buy new trash
pump0900 Arrive at Home Depot purchase trash pump
& 15' garden hose

0940 Arrive onsite at smwd-2 Area Landfill

0944 Begin transferring liquid IDW from drilling
activities, well development, & well purging
& sampling to polytank1115 Finish transferring liquid IDW to polytank
Will drop trailer & head to lanes to get
hose fittings to connect garden hose to
GAC unit. Jay Kolb will stay behind to
paint well completions

3/1/12

AK Steel

J. Kolb

1225 Return to site. Jay Kolb is finishing his last well

1245 Pick up trailer & load Empty drums in Jay Kolb's truck

1300 Arrive at AK Steel Main Facility, unload empty drums

1308 Begin transfer liquid IDW from polytank to drums. Jay Kolb back to SWMU-2 to paint 2nd Cont

1315 Power inverter stopped working.

1318 ~~Offsite~~ Off site to Fyling J to get new power inverter

1355 Return to AK Steel Main Facility

1404 Begin transferring liquid IDW from polytank to drums again

1430 Finish transferring liquid IDW to drums & begin pumping liquid IDW from polytank drums through GAC unit into polytank

1502 Finish running all liquid IDW through GAC

1610 Jay Kolb arrive back at AK Steel main facility

1612 begin locating surface soil sample locations

1700 Finish locating surface soil locations, Jay Kolb offsite

1810 Arrive at SWMU-2 Area Landfill to collect round of water levels & total depths

2MW01 WL-32.60 TD-47.73

2MW04 WL-32.73 TD-21.3

2MW02 WL-22.75 TD-32.75

2MW05 WL-32.70 TD-13.6

2MW03 WL-14.58 TD-32.72

2MW06 WL-32.97 TD-15.3

1800 offsite

3/2/12

AK Steel

Date - Friday, March 2, 2012

Task - Surface Soil & Liquid IDW sampling

Weather - Overcast rain/snow mix 30's - 40's

Personnel - Justin Carler

Equipment - None

0650 Arrive at SWMU-2 Area Landfill

0658 Label soil IDW Drums

0710 Pick up trash

0716 Offsite from SWMU-2 Area Landfill

0723 Get ice

0740 Arrive at AK Steel Main Facility

0742 Decon stainless steel bowls & sampling trowels (3 each)

0755 Collect 13SM01/SS01/0-0.5 for RCRA metals

~~0805~~ Collect 13SM01/SS01/0-0.5A for RCRA metals (Dup)

0805 Collect 13SM02/SS01/0-0.5 for RCRA metals

0810 Collect 13SM03/SS01/0-0.5 for RCRA metals

0813 Decon stainless steel bowls & sampling trowels

0820 Collect 13SM04/SS01/0-0.5 for RCRA metals

0825 Collect 13SM05/SS01/0-0.5 for RCRA metals

0830 Collect 13SM06/SS01/0-0.5 for RCRA metals

0836 Decon stainless steel bowls & sampling trowels

0845 Collect 17SM01/SS01/0-0.5 for RCRA metals

0850 Collect 17SM02/SS01/0-0.5 for RCRA metals

0855 Collect 17SM03/SS01/0-0.5 for RCRA metals

0859 Decon stainless steel bowls & sampling trowels

3/2/12

AK Steel

J. Collier

- 0910 Collect 175m04/5501/0-0.5 for RCRA metals
- 0915 Collect 175m05/5501/0-0.5 for RCRA metals
Collect 175m05/5501/0-0.5A for RCRA metals (Dup)
- 0925 Collect 175m06/5501/0-0.5 for RCRA metals
- 0932 Decon stainless steel bowls & sampling towels
- 0940 Collect 335m06/5501/0-0.5 for RCRA metals
- 0950 Collect 335m05/5501/0-0.5 for RCRA metals
- 0957 Sharon Shelton called to check on progress
- 1005 Collect 335m04/5501/0-0.5 for RCRA metals
- 1012 Decon stainless steel bowls & sampling towels
- 1020 Collect 335m03/5501/0-0.5 for RCRA metals
Collect 335m03/5501/0-0.5 MS for RCRA metals
Collect 335m03/5501/0-0.5 MSD for RCRA metals
- 1035 Collect 335m02/5501/0-0.5 for RCRA metals
- 1040 Collect 335m01/5501/0-0.5 for RCRA metals
- 1048 Decon stainless steel bowls & sampling towels
- 1100 Collect 335m01/5501/ERB for RCRA metals
Rinsate Sample Fisher HPLC water Lot #
108387
- 1110 Pack cooler & fill out chain of custody
- 1215 Collect Liquid IDW/5501 for VOC, Total Lead,
Total Cadmium, Dissolved Lead, Dissolved
Cadmium, ~~Dissolved Hexavalent Chromium~~
- 1218 Called Test America discuss the Hexavalent
Chromium & Liquid IDW sample. They want
the Hexavalent Chromium sample sampled

3/2/12

AK Steel

J. Collier

- as late in the day as possible, will throw out the
Hexavalent Chromium sample will collect later in
the day
- 1225 Offsite to KC office to KC office to return
GAC unit & Trailer
- 1310 Arrive at KC office, unload GAC tank
- 1343 Arrive at 404 Building & drop off trailer
- 1352 Arrive back at KC office, unload truck
- 1415 Leave KC office, back to site to collect 20
Liquid IDW dissolved Hexavalent
- 1440 Arrive at AK Steel main facility
- 1450 Collect Liquid IDW/5501 for Dissolved Hexavalent
Chromium
- 1455 Offsite, to gas station to get ice & pack
coolers
- 1530 Arrive at gas station, get ice & pack coolers
- 1630 Arrive at ~~gas station~~ FedEx & drop off 2 cooler
for Priority Overnight Saturday Delivery
Tracking # 8986-9324-9310

3/2/12

J. Collier

Appendix E
Groundwater Sampling Forms

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/28/12 SITE: AK Steel PID READING at WELL HEAD (ppm): 0.0

PROJECT NUMBER: 66252 WEATHER: Overcast, rain, 40's, breezy 5-10 mph S/SW

WELL NUMBER: 2mw01

DEPTH TO WATER (ft): 33.91 TOTAL DEPTH (ft): 47.70 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 42.50' DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1324	I	150	7.13	15.07	1.489	102	-57.7	1.75	34.37
1329	0.20	150	7.13	15.00	1.644	107	-48.7	0.45	35.92
1334	0.40	150	7.11	14.73	1.647	88.2	-48.0	0.32	36.26
1339	0.60	125	7.11	14.58	1.647	65.2	-48.1	0.35	36.65
1344	0.77	100	7.12	14.41	1.643	54.4	-49.5	0.35	36.79
1349	0.90	100	7.12	14.36	1.640	53.2	-50.3	0.26	36.85
1354	1.05	100	7.11	14.30	1.641	45.1	-50.9	0.28	36.93
1359	1.20	100	7.12	14.27	1.640	43.6	-51.1	0.20	36.99
1404	1.37	100	7.12	14.25	1.640	41.6	-51.3	0.18	37.04
1409	1.50	100	7.11	14.23	1.638	36.7	-52.4	0.17	37.04
1414	1.63	100	7.11	14.22	1.639	39.3	-53.2	0.16	37.04

Continued on back (circle one) yes / (no)

SAMPLING

Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1415	1.63	7.11	14.22	1.639	39.3	-53.2	0.16	37.04	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): 37.04 TIME FINAL DEPTH TAKEN: 1420

SAMPLE ID: 2mw01 / 6w01 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: VOC, Total Lead & Cadmium, Dissolved Lead, Cadmium & Chromium Hexavalen

IDW TOTAL: 1.63 Flow Through Cell Model Number: YSI - 556 mps

PREPARED: NAME SIGNATURE DATE
Justin Lahr 3/28/12

REVIEWED: _____

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/28/12 SITE: AK Steel PID READING at WELL HEAD (ppm): 0.0
 PROJECT NUMBER: 66252 WEATHER: Overcast 40's, breezy 5-10 mph S/SW

WELL NUMBER: 2mw02

DEPTH TO WATER (ft): 22.84 TOTAL DEPTH (ft): 32.75 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 29.00 DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailor Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1114	1	300	8.04	14.52	0.516	300	20.7	3.21	23.03
1119	0.40	300	7.15	15.04	0.567	252	26.5	3.00	23.03
1124	0.80	300	7.11	15.23	0.541	238	24.2	2.71	23.03
1129	1.20	300	7.07	15.18	0.527	200	21.5	2.55	23.03
1134	1.60	300	7.06	15.14	0.520	187	20.6	2.15	23.03
1139	2.00	300	7.01	15.21	0.503	162	20.7	1.82	23.03
1144	2.40	300	7.00	15.38	0.493	128	22.9	1.61	23.03
1149	2.80	300	6.98	15.39	0.487	163	24.2	1.48	23.03
1154	3.20	300	6.98	15.56	0.479	92.6	27.9	1.26	23.03
1159	3.60	300	6.97	15.61	0.473	77.5	28.5	1.00	23.03
1204	4.00	300	6.97	15.48	0.471	62.3	29.3	0.93	23.03
1209	4.40	300	6.98	15.63	0.470	58.8	30.0	0.90	23.03
1214	4.80	300	6.97	15.61	0.475	54.5	29.7	0.87	23.03
1219	5.20	300	6.96	15.57	0.477	51.3	30.4	0.95	23.03
1224	5.60	300	6.95	15.50	0.478	42.2	30.0	0.84	23.03

Continued on back (circle one) yes / (no)

SAMPLING

Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1225	5.60	6.95	15.50	0.478	40.2	30.0	0.84	23.03	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): 23.03 TIME FINAL DEPTH TAKEN: 1257

SAMPLE ID: 2mw02/6w01 SAMPLE ID FOR QC: 2mw02/6w01ms & 2mw02/6w01msd

PARAMETERS REQUESTED FOR ANALYSIS: VOC, Total Lead & Cadmium, Dissolved Lead, Cadmium & Chromium ^{Hexavalent}

IDW TOTAL: 5.60 Flow Through Cell Model Number: YSI-556 mps

NAME: Justin Carver SIGNATURE: [Signature] DATE: 2/28/12
 PREPARED: _____
 REVIEWED: _____

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/29/12 SITE: AK steel PID READING at WELL HEAD (ppm): 0.0

PROJECT NUMBER: 66252 WEATHER: Clear, sunny 50's Windy 30-35 mph S/SW

WELL NUMBER: 2mw03

DEPTH TO WATER (ft): 20.38 TOTAL DEPTH (ft): 32.71 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 30.00 DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1358	I	150	6.83	14.43	0.687	52.8	-68.0	1.30	20.90
1403	0.20	150	6.53	14.48	0.706	56.8	-47.3	0.42	21.43
1408	0.40	100	6.40	14.42	0.713	60.2	-39.8	0.30	21.60
1413	0.53	100	6.35	14.35	0.714	63.4	-38.0	0.26	21.75
1418	0.66	100	6.30	14.30	0.714	53.7	-35.4	0.21	21.78
1423	0.79	100	6.31	14.25	0.713	49.6	-33.7	0.17	21.78
1428	0.92	100	6.33	14.27	0.713	47.2	-32.5	0.18	21.78
1433	1.05	100	6.34	14.30	0.714	45.2	-30.8	0.16	21.78

Continued on back (circle one) yes no

SAMPLING

Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1435	1.05	6.34	14.30	0.714	45.1	-30.8	0.16	21.28	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): 21.78 TIME FINAL DEPTH TAKEN: 1443

SAMPLE ID: 2mw03/gw01 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: VOC, Total Lead + Cadmium, Dissolved Lead, Cadmium, Chromium

IDW TOTAL: 1.05 Flow Through Cell Model Number: YST-556 mps

NAME: Justin Carlier SIGNATURE: [Signature] DATE: 2/29/12

REVIEWED: _____

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/29/12 SITE: Ak Steel PID READING at WELL HEAD (ppm): 0.0
PROJECT NUMBER: 06252 WEATHER: Clear, sunny, windy 40-50 mph S/SW

WELL NUMBER: 2mw04

DEPTH TO WATER (ft): 21.36 TOTAL DEPTH (ft): 32.75 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 30.00 DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1103	I	225	6.78	13.50	1.139	65.2	-149.6	1.21	21.45
1108	0.29	225	6.59	14.11	1.162	58.6	-150.8	0.39	21.45
1113	0.48	225	6.42	14.26	1.165	58.5	-133.6	0.18	21.45
1118	0.77	225	6.43	14.33	1.170	47.2	-116.7	0.20	21.45
1123	1.06	225	6.42	14.35	1.173	50.8	-110.4	0.17	21.45
1128	1.35	225	6.45	14.47	1.175	37.8	-104.6	0.16	21.45
1133	1.64	225	6.47	14.49	1.178	32.2	-100.3	0.15	21.45
1138	1.93	225	6.47	14.53	1.181	30.2	-98.4	0.15	21.45

Continued on back (circle one) yes / no

SAMPLING

Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1440	1.93	6.47	14.53	1.181	30.2	-98.4	0.15	21.45	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): 21.45 TIME FINAL DEPTH TAKEN: 1148

SAMPLE ID: 2mw04/6w01 SAMPLE ID FOR QC: 2mw04/6w01A

PARAMETERS REQUESTED FOR ANALYSIS: UOC, Total Lead & Cadmium, Dissolved Lead, Cadmium, + Chromium ^{Hexavalent}

IDW TOTAL: 1.93 Flow Through Cell Model Number: YST-556 mPS

NAME: Justin Carhu SIGNATURE: [Signature] DATE: 2/29/12
PREPARED: _____ REVIEWED: _____

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/29/12 SITE: AK: Steel PID READING at WELL HEAD (ppm): 0.0

PROJECT NUMBER: 66252 WEATHER: Clear, sunny, windy 30-40mph S/SW

WELL NUMBER: 2mw05

DEPTH TO WATER (ft): 15.44 TOTAL DEPTH (ft): 32.70 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 30.00 DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

[illegible]

SAMPLING

Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1310	2.80	13.79	6.47	0.967	21.1	-96.0	0.16	16.48	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): ~~1515~~ 1648 TIME FINAL DEPTH TAKEN: 1315

SAMPLE ID: 2mw05/6w01 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: VOC, Total Lead & Cadmium, Dissolved Lead, Cadmium, & Chromium

IDW TOTAL: 2.80 Flow Through Cell Model Number: YST - 556 MPS

NAME SIGNATURE DATE
PREPARED: Justin Coker [Signature] 2/29/12

REVIEWED: _____

FIELD GROUNDWATER SAMPLING REPORT

DATE: 2/29/12 SITE: AK Steel PID READING at WELL HEAD (ppm): 0.0

PROJECT NUMBER: 66252 WEATHER: Partly cloudy, low 40's, windy 40-50 mph S/SW

WELL NUMBER: 2mw06

DEPTH TO WATER (ft): 15.94 TOTAL DEPTH (ft): 32.96 WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): 30.00 DEPTH TO TOP OF YSI (ft): NA (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailor Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1600	0.1	200	6.50	15.00	1.107	76.5	-105.3	1.67	16.43
1605	0.28	200	6.44	14.82	1.154	81.5	-100.3	0.65	16.82
1610	0.56	200	6.34	14.68	1.162	83.3	-95.4	0.50	17.20
1615	0.84	200	6.35	14.61	1.165	75.4	-88.8	0.40	17.50
1620	1.12	100	6.37	14.61	1.163	82.4	-78.1	0.35	17.75
1625	1.25	100	6.39	14.64	1.158	91.3	-70.8	0.33	18.02
1630	1.38	100	6.38	14.62	1.155	108	-68.3	0.34	18.18
1635	1.51	100	6.39	14.48	1.147	104	-64.8	0.36	18.22
1640	1.64	100	6.43	14.40	1.138	92.8	-64.6	0.30	18.22
1645	1.77	100	6.42	14.31	1.135	86.7	-64.6	0.29	18.22
1650	1.90	100	6.42	14.21	1.134	75.3	-65.5	0.29	18.22
1655	2.03	100	6.43	14.22	1.133	63.6	-66.8	0.28	18.22
1700	2.16	100	6.43	14.27	1.132	62.6	-67.4	0.26	18.22
1705	2.29	100	6.42	14.22	1.130	62.6	-68.9	0.27	18.22
1710	2.42	100	6.43	14.18	1.127	57.4	-71.1	0.24	18.22

Continued on back (circle one) yes / no

SAMPLING

Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1805	3.76	6.43	13.88	1.120	49.8	-79.4	0.24	18.22	clear

FERROUS IRON (mg/L): NA

FINAL DEPTH TO WATER (ft TOC): 18.22 TIME FINAL DEPTH TAKEN: 1813

SAMPLE ID: 2mw06/0w01 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: VOC, Total Lead + Cadmium, Dissolved Lead, Cadmium, & Chromium Hexavalent

IDW TOTAL: 3.76 Flow Through Cell Model Number: YSI-556 MPS

NAME: Justin Carter SIGNATURE: [Signature] DATE: 2/29/12

REVIEWED: _____

WELL NUMBER: 2mw06

[illegible]

COMMENTS

Appendix F
Photographic Log

SWMU-2 Photo Log AK Steel – Kansas City, MO



Photo 1: Unloading Geoprobe Sonic Rig.



Photo 2: Unloading drilling rods from support truck.



Photo 3: Setting up drill rig at MW-5.



Photo 4: Setting up drill rig at MW-5.

SWMU-2 Photo Log
AK Steel – Kansas City, MO



Photo 5: Collecting soil cores from sample barrel.



Photo 6: Collecting soil cores from sample barrel.



Photo 7: Collecting soil cores from sample barrel.



Photo 8: Soil cores after being removed from sample barrel laid out for soil logging.

SWMU-2 Photo Log
AK Steel – Kansas City, MO



Photo 9: Drilling activities at MW-2.



Photo 10: Drilling activities at MW-2.

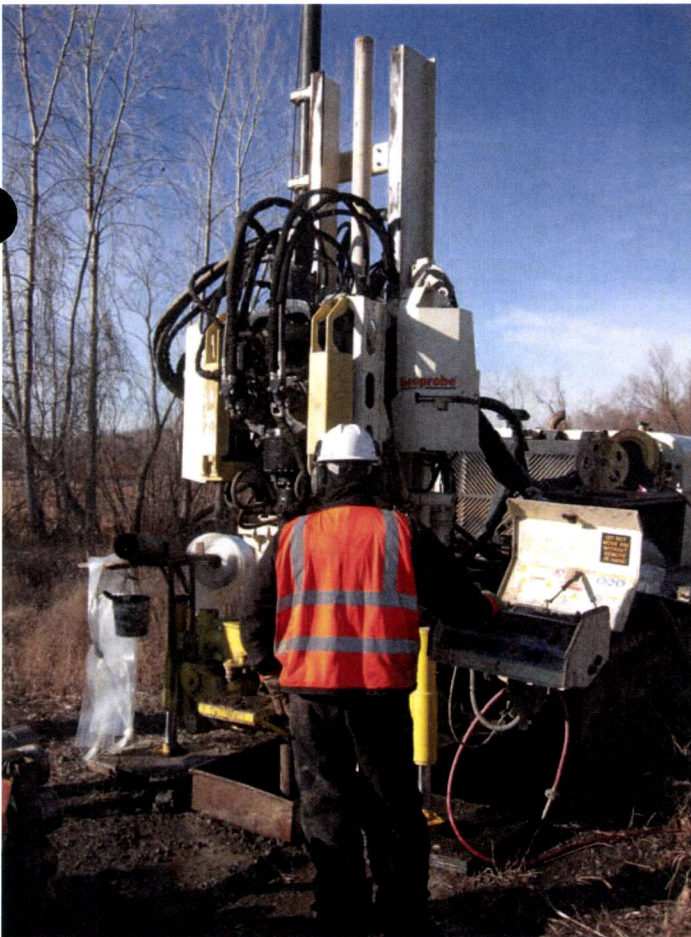


Photo 11: Drilling activities at MW-2.



Photo 12: Drilling activities at MW-2.

SWMU-13 Photo Log
AK Steel – Kansas City, MO



Photo 1: 13SM01 Soil Material.



Photo 2: 13SM02 Soil Material.



Photo 3: 13SM03 Soil Material.



Photo 4: 13SM04 Soil Material.

SWMU-13 Photo Log
AK Steel – Kansas City, MO



Photo 5: 13SM05 Soil Material.



Photo 6: 13SM06 Soil Material.

SWMU-17 Photo Log
AK Steel – Kansas City, MO



Photo 1: 17SM01 Soil Material.



Photo 2: 17SM02 Soil Material.



Photo 3: 17SM03 Soil Material.



Photo 4: 17SM04 Soil Material

SWMU-17 Photo Log
AK Steel – Kansas City, MO

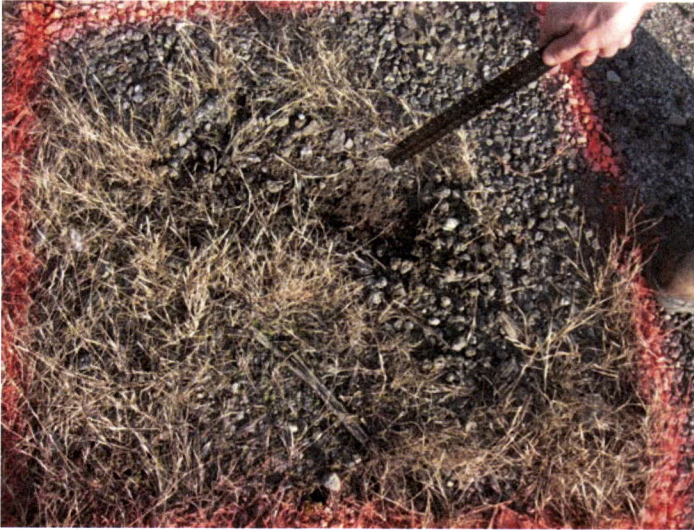


Photo 5: 17SM05 Soil Material.



Photo 6: 17SM06 Soil Material.

SWMU-33 Photo Log
AK Steel – Kansas City, MO



Photo 1: 33SM01 Soil Material.



Photo 2: 33SM02 Soil Material.



Photo 3: 33SM03 Soil Material.



Photo 4: 33SM04 Soil Material

SWMU-33 Photo Log
AK Steel – Kansas City, MO



Photo 5: 33SM05 Soil Material.



Photo 6: 33SM06 Soil Material.

Appendix G
Investigation Derived Waste

Table G-1
Liquid IDW Sample Results
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Groundwater Screening Level		Sample ID: Date: Lab ID:	IDW-Liquid 3/2/2012 280-26217-2
Comments:				
METALS				
Cadmium, Dissolved	0.005	MCL	µg/L	1 U
Cadmium, Total	0.005	MCL	µg/L	0.16 J
Lead, Dissolved	0.015	MCL	µg/L	0.2 J
Lead, Total	0.015	MCL	µg/L	4.2
Chromium, Hexavalent	0.000043	RSL	µg/L	20 U
VOLATILE ORGANIC COMPOUNDS				
1,1,1-Trichloroethane	200	MCL	µg/L	1 U
1,1,2,2-Tetrachloroethane	0.066	RSL	µg/L	1 U
1,1,2-Trichloroethane	5	MCL	µg/L	1 U
1,1-Dichloroethane	2.4	RSL	µg/L	1 U
1,1-Dichloroethene	7	MCL	µg/L	1 U
1,2-Dichloroethane	5	MCL	µg/L	2.2
1,2-Dichloropropane	5	MCL	µg/L	1 U
2-Butanone	4900	RSL	µg/L	14
2-Hexanone	34	RSL	µg/L	5 U
4-Methyl-2-pentanone	1000	RSL	µg/L	5 U
Acetone	12000	RSL	µg/L	200
Benzene	5	MCL	µg/L	1 U
Bromodichloromethane	80 a	MCL	µg/L	1 U
Bromoform	80 a	MCL	µg/L	1 U
Bromomethane	7	RSL	µg/L	2 U
Carbon disulfide	720	RSL	µg/L	2 U
Carbon tetrachloride	5	MCL	µg/L	1 U
Chlorobenzene	100	MCL	µg/L	1 U
Chloroethane	21000	RSL	µg/L	2 U
Chloroform	80 a	MCL	µg/L	0.18 J
Chloromethane	190	RSL	µg/L	2 U
cis-1,2-Dichloroethene	70	MCL	µg/L	0.82 J
cis-1,3-Dichloropropene	0.41 b	RSL	µg/L	1 U
Dibromochloromethane	80 a	MCL	µg/L	1 U
Ethylbenzene	700	MCL	µg/L	1 U
Methylene chloride	5	MCL	µg/L	1 J B U*
Styrene	100	MCL	µg/L	1 U
Tetrachloroethene	5	MCL	µg/L	1 U
Toluene	1000	MCL	µg/L	2.3
trans-1,2-Dichloroethene	100	MCL	µg/L	1 U
trans-1,3-Dichloropropene	0.41 b	RSL	µg/L	3 U
Trichloroethene	5	MCL	µg/L	1 U
Vinyl chloride	2	MCL	µg/L	1 U
Xylenes, Total	10000	MCL	µg/L	0.7 J

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

µg/L - micrograms per liter

MCL - Safe Drinking Water Act Maximum Contaminant Level (USEPA, 2009)

RSL - Regional Screening Level Summary Table (USEPA, November 2011)

U* - Qualified as not detected during QC review.

Table G-2
Solid IDW Sample Results
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID: Date: Lab ID: Comments:	IDW COMPOSITE-Soil 2/29/2012 280-26093-1	IDW DRUM 1-Soil 2/29/2012 280-26093-2	IDW DRUM 2-Soil 2/29/2012 280-26093-3	IDW DRUM 3-Soil 2/29/2012 280-26093-4	IDW DRUM 4-Soil 2/29/2012 280-26093-5
METALS, Total								
Arsenic, Total	24	BVBG	mg/kg	11	NA	NA	NA	NA
Barium, Total	190000	RSL	mg/kg	170	NA	NA	NA	NA
Cadmium, Total	800	RSL	mg/kg	7.3	NA	NA	NA	NA
Chromium, Total	1500000	RSL	mg/kg	520	NA	NA	NA	NA
Lead, Total	1531	PRG	mg/kg	280	NA	NA	NA	NA
Mercury, Total	43	RSL	mg/kg	0.085	NA	NA	NA	NA
Selenium, Total	5100	RSL	mg/kg	3.3 U	NA	NA	NA	NA
Silver, Total	5100	RSL	mg/kg	0.75	NA	NA	NA	NA
METALS, TCLP								
Arsenic, TCLP	5	CFR	mg/L	0.03 J B U*	NA	NA	NA	NA
Barium, TCLP	100	CFR	mg/L	1.9 B	NA	NA	NA	NA
Cadmium, TCLP	1	CFR	mg/L	0.071 J	NA	NA	NA	NA
Chromium, TCLP	5	CFR	mg/L	0.077 J	NA	NA	NA	NA
Lead, TCLP	5	CFR	mg/L	0.18 J B	NA	NA	NA	NA
Mercury, TCLP	0.2	CFR	mg/L	0.002 U	NA	NA	NA	NA
Selenium, TCLP	1	CFR	mg/L	0.1 U	NA	NA	NA	NA
Silver, TCLP	5	CFR	mg/L	0.0048 J	NA	NA	NA	NA
VOCs								
2-Hexanone	1400	RSL	mg/kg	NA	0.025 U	0.064 U	0.025 U	0.029 U
4-Methyl-2-pentanone	53000	RSL	mg/kg	NA	0.025 U	0.064 U	0.025 U	0.029 U
Acetone	630000	RSL	mg/kg	NA	0.41 J*	0.82 J*	0.4 J*	0.27
Benzene	5.4	RSL	mg/kg	NA	0.0062 U	0.0088 J*	0.0061 U	0.0034 J
Bromodichloromethane	1.4	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Bromoform	220	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Bromomethane	32	RSL	mg/kg	NA	0.012 U	0.032 U	0.012 U	0.014 U
Carbon disulfide	3700	RSL	mg/kg	NA	0.0062 U	0.0043 J*	0.0061 U	0.0042 J B U*
Carbon tetrachloride	3	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Chlorobenzene	1.4	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Chloroethane	61000	RSL	mg/kg	NA	0.012 U	0.032 U	0.012 U	0.014 U
Chloroform	1.5	RSL	mg/kg	NA	0.012 U	0.0018 J*	0.012 U	0.014 U
Chloromethane	500	RSL	mg/kg	NA	0.012 U	0.032 U	0.012 U	0.014 U
cis-1,2-Dichloroethene	2000	RSL	mg/kg	NA	0.0031 U	0.0079 U	0.0031 U	0.0036 U
cis-1,3-Dichloropropene	20000	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Dibromochloromethane	3.3	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Ethylbenzene	27	RSL	mg/kg	NA	0.0062 U	0.018 J*	0.0061 U	0.0072 U

Table G-2
Solid IDW Sample Results
Additional Sampling of SWMUs 2, 4, 13, 17, and 33
AK Steel Facility - Kansas City, Missouri

Parameter	Soil Screening Level		Sample ID: Date: Lab ID: Comments:	IDW COMPOSITE-Soil 2/29/2012 280-26093-1	IDW DRUM 1-Soil 2/29/2012 280-26093-2	IDW DRUM 2-Soil 2/29/2012 280-26093-3	IDW DRUM 3-Soil 2/29/2012 280-26093-4	IDW DRUM 4-Soil 2/29/2012 280-26093-5
Methylene chloride	960	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Styrene	36000	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Tetrachloroethene	110	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Toluene	45000	RSL	mg/kg	NA	0.12 J*	0.14 J*	0.082 J*	0.046
trans-1,2-Dichloroethene	690	RSL	mg/kg	NA	0.0031 U	0.0079 U	0.0031 U	0.0036 U
trans-1,3-Dichloropropene	20000	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Trichloroethene	6.4	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Vinyl chloride	1.7	RSL	mg/kg	NA	0.0062 U	0.016 U	0.0061 U	0.0072 U
Xylenes, Total	2700	RSL	mg/kg	NA	0.0062 U	0.062 J*	0.0061 U	0.0072 U
VOCs, TCLP								
1,1-Dichloroethene, TCLP	0.7	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dichloroethane, TCLP	0.5	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
2-Butanone, TCLP	200	CFR	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U
Benzene, TCLP	0.5	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride, TCLP	0.5	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Chlorobenzene, TCLP	100	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform, TCLP	6	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Tetrachloroethene, TCLP	0.7	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Trichloroethene, TCLP	0.5	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U
Vinyl chloride, TCLP	0.2	CFR	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U

Bold - Constituent was detected.

Shaded - Constituent exceeded screening level.

J - Result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.

J* - Qualified as estimated during QC review.

mg/kg - milligrams per KILOGRAM

mg/L - milligrams per LITER

TCLP - Toxicity Characteristics Leaching Procedure

U* - Qualified as not detected during QC review.

BVBG - Blue Valley Industrial Corridor Soils Background Study Report, Brownfields Showcase Project (USACE, 2003)

CFR - TCLP criteria from 40 CFR 261.24

PRG - Site-specific preliminary remediation goal for lead (USEPA, 2010)

RSL - Regional Screening Level Summary Table for Industrial Soil (USEPA, November 2011)

Appendix H
Survey Data



LAND SURVEYORS
INDUSTRIAL MEASUREMENT SPECIALISTS

FOUNDER: JAMES P. ANDERSON 1897 — 1948

PROFESSIONAL LAND SURVEYORS
JAMES S. ANDERSON, President
OLIVER S. ANDERSON 1926-1983
ROBERT W. ANDERSON 1924-1965
R.C. ROUDEBUSH
THOMAS L. LANG
PHILIP J. HENEHAN
JOHN P. WEBSTER
ROBERT J. ANDERSON
JENIFER K. ANDERSON

March 5, 2012

Burns & Mc Donnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Sharon Shelton

Email: sshelton@burnsmcd.com

RE: Monitor Well and Borehole locations at the AK Steel Site,
Area SWMU 2, Kansas City, Jackson County, Missouri

Dear Sharon:

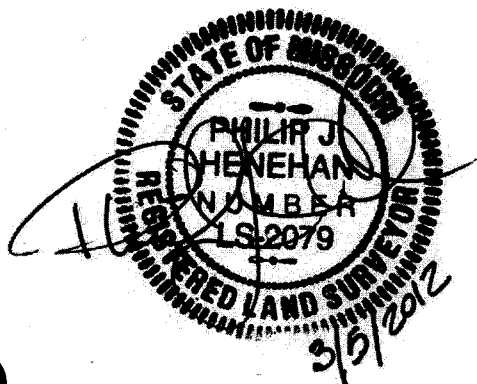
Listed below are the Missouri State Plane Coordinates and Elevations of the points located
on February 28, 2012.

Monitor Well	Missouri State Plane Coordinate		Elevation	
	North	East	Top PVC Pipe	Ground
2MW01	1074759.0	507347.8	748.50	745.96
2MW02	1075471.6	509101.6	734.19	731.87
2MW03	1074851.6	508392.5	732.21	729.88
2MW04	1074549.8	508611.3	733.16	730.63
2MW05	1074232.1	507648.7	731.40	729.05
2MW06	1073891.5	507636.1	733.16	730.67

The Missouri State Plane coordinates are on NAD'29 datum, west zone, in feet. The elevations
are NAVD'88 datum. The ground elevations were taken on the north side of the concrete pads.

Sincerely,

Philip J. Henehan, PLS
ANDERSON SURVEY COMPANY



*The quiet of our estates, in a great measure, depends upon
the faithfulness, understanding, and care of our surveyors.
Virginia Statutes, 1705*